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1979 FOOD AND AGRICULTURAL OUTLOOK

Papers Presented at the Food and Agricultural Outlook
Conference Sponsored by the U.S. Department
of Agriculture—Held in Washington, D.C.,
November 13-16, 1978

PREPARED FOR THE
COMMITTEE ON AGRICULTURE, NUTRITION,
AND FORESTRY
UNITED STATES SENATE

DECEMBER 29, 1978



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FOREWORD

The 1979 Food and Agricultural Outlook Conference once again brought together Americans from all segments of the food and fiber system—producer, processor, Government planner, trader, and consumer—to examine a vast range of issues, problems, prospects, and situations.

The Conference, again sponsored by the U.S. Department of Agriculture, focused special attention on two vital concerns that have important implications for all Americans: inflation and energy. "Inflation: How, Why, and Impacts on the Producer, Consumer, and Labor" was the theme of a special panel discussion featuring representatives from organized labor, the Federal Reserve Board, USDA, and the academic community. Energy concerns were expertly treated during another all day session.

Particular attention was paid to the impact of Government programs, policies, and actions on productivity, marketing, and world trade.

Nutrition experts discussed the many issues concerning the diet of Americans. Rural housing problems and prospects received considerable evaluation at a gathering of building industry and Government spokespersons.

These topics, along with a full range of topics covering all aspects of American agriculture from the farm to the consumer, were dealt with in detail by the conferees.

In the interest of providing members of the Senate Committee on Agriculture, Nutrition, and Forestry, the Senate, and the general public with timely and useful information surrounding America's biggest business, agriculture, I have asked that the material presented at the 1979 Food and Agriculture Outlook Conference be published as a committee print.

The views and conclusions presented in this publication are those of the authors and do not necessarily represent the opinions of the committee or USDA; however, the committee certainly recognizes the participants' professionalism and capabilities in their respective fields.

HERMAN E. TALMADGE, *Chairman.*

(III)

EXPERIMENT I

THE EFFECT OF TEMPERATURE

The purpose of this experiment was to determine the effect of temperature on the rate of reaction between hydrogen peroxide and potassium iodide. The reaction was carried out in a series of test tubes, and the time taken for the reaction to complete was measured. The results are shown in the table below.

Temperature (°C)	Time taken for reaction to complete (s)
10	120
20	60
30	30
40	15
50	8

From the table, it can be seen that the rate of reaction increases as the temperature increases. This is because the molecules have more kinetic energy and are therefore more likely to collide with sufficient energy to overcome the activation energy barrier.

The following table shows the effect of concentration on the rate of reaction. The concentration of hydrogen peroxide was varied, while the concentration of potassium iodide was kept constant. The results are shown in the table below.

Concentration of H ₂ O ₂ (M)	Time taken for reaction to complete (s)
0.1	120
0.2	60
0.3	40
0.4	30

From the table, it can be seen that the rate of reaction increases as the concentration of hydrogen peroxide increases. This is because there are more molecules present, and therefore a higher probability of collision.

The following table shows the effect of catalyst on the rate of reaction. The reaction was carried out with and without a catalyst, and the time taken for the reaction to complete was measured. The results are shown in the table below.

Catalyst	Time taken for reaction to complete (s)
None	120
Potassium iodide	30

From the table, it can be seen that the rate of reaction is significantly increased by the presence of a catalyst. This is because the catalyst provides an alternative pathway for the reaction, with a lower activation energy barrier.

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CONFERENCE OPENING

(By Howard W. Hjort, Director of Economics, Policy
Analysis and Budget, USDA)

On behalf of the Secretary, the Department, and myself, I am pleased to welcome you to this—the 55th Annual Outlook Conference.

First, I want to express my appreciation and the appreciation of the entire Office of the Secretary, to the Conference Committee: Dawson Ahalt (chairperson), Ken Farrell, Tom Saylor, Ray Scott, and, the one who really put it together, Alan Bird. They have, I believe, developed an outstanding program.

When Secretary Henry Wallace called for the first Outlook Conference back in 1923, attendance was by invitation only, I am told, the conference itself was held behind locked doors. In that secretive atmosphere, the initial attendees reviewed the Department's first report on farmers' planting intentions. It was their responsibility to see whether the acreages that farmers had reported were in line with perspective demand. The doors were locked to prevent the information discussed from having an impact on commodity markets.

There have been some changes since that first conference. There have been no locked doors for many years now. As the proceedings have become more open, the content of our outlook conferences has become more varied and of greater relevance to the times, the scope and depth has increased and our audience has become broader.

Yet, the outlook conference has remained unchanged in its function: to serve as a forum for discussion and debate. We all come to this conference with unique experiences and perspectives that we can share. Thus, there are no teachers or students—only sharers and learners, and the information and opinions that we discuss are for everyone's use, to help all of us know better where we are now with respect to food and agriculture, as well as what the prospects are for the coming year.

This conference is one of several ways in which we try to provide timely and accurate intelligence on United States and world agriculture, food and fiber markets, and the use of food and farm products in industry and the home. Knowing the factors affecting our food and agricultural system, understanding the role that our system plays in the larger domestic and international economic, social and environmental concerns, and recognizing the alternatives available to effectively deal with these issues are vital if we as Government representatives, farmers, consumers, and business people are to make wise decisions for the future.

Creating and maintaining a strong system of agricultural and economic information analysis is an awesome responsibility. World leaders and their Ministers of Agriculture, of Food, of Finance and of Planning rely upon assessments of the state of world food and agriculture and judgments on the outlook for the near and longer term.

At present, there are only two agencies in the entire world which provide this global information and analysis: the Food and Agriculture Organization of the United Nations and the U.S. Department of Agriculture.

It is absolutely essential to have objectivity associated with this function of data collection, analysis, and reporting. It is also paramount that this information be reliable and issued in a timely fashion. Developing our intelligence and analysis functions to meet these criteria has been a top priority for this administration—and for me, personally. Over the past 2 years, we have taken steps to ensure that we have an objective, reliable, and timely information system.

Last year, the World Food and Agricultural Outlook and Situation Board was established. The Board's task is to assure that the intelligence responsibilities and reports of the various agencies of the Department are coordinated and consistent and that the very best information from all possible sources is effectively utilized. To assure objectivity and integrity in the intelligence process, the Board is set apart from the administration of programs; it functions as an independent agency. No political appointee is a member of any board; the members are all professional civil servants.

I have traveled to FAO's headquarters in Rome twice to seek ways we can work together more effectively in providing information on food and agriculture.

We have established a Weather and Climate Office with the World Board that is jointly staffed by specialists from NOAA and USDA. Other changes designed to improve our intelligence system have been made.

Our goal is to have the very best intelligence system of its kind to help farmers, consumers, processors, transporters, wholesalers, and retailers as well as those of us in Government, make wise decisions for the future. Given the importance of food and the sensitivity of our agricultural and domestic economy to events around the world, we can afford to do no less.

This conference is an important part of that information-sharing process. For the past 55 years, it has been the forum for the presentation of reports and discussions providing objective, factual, and pertinent information to help us know what factors will affect the United States and world food and agricultural picture in the present and the future.

During the next 4 days, we will have participants from Government and business discussing agricultural policy issues, the outlook for specific commodities, transportation and storage problems, family living concerns, energy problems, and inflation. We'll examine those subjects in detail and hopefully, get your questions and views on these matters. Once the conference has concluded, I hope we will get your views on how we might improve future outlook conferences.

Again, welcome here. Now, let's get on with Outlook '79.

**OUTLOOK FOR FARM AND FOOD POLICY IN
THE UNITED STATES**

CURRENT U.S. AGRICULTURAL TRADE CONCERNS

(By G. Edward Schuh, Deputy Assistant Secretary of Agriculture, USDA)

It is a pleasure to discuss agricultural trade concerns with you this afternoon. It is difficult to identify a subject of more importance to the health and vitality of the U.S. agricultural sector as we look to the years ahead. It is also difficult to identify an aspect of the U.S. agricultural economy that has undergone more change in recent years, or about which there is more uncertainty as we look to the future.

The importance of trade to U.S. agriculture is now well recognized. The output of 1 out of every 3 acres is now sold abroad, and approximately one-fourth of farm income is due to these sales. U.S. agricultural exports in the fiscal year just ending were \$27.3 billion. That was \$3.3 billion more than the previous year, and a record total for the 9th straight year. As recently as 1970, our agricultural exports amounted to only \$6.7 billion.

Impressive as these data are, they fall far short of telling the whole story. Although not fully recognized by many, our commodity policies are now predicated on strong export markets. Without them, U.S. agriculture would face an enormous adjustment. In the course of making that adjustment, the costs to the U.S. taxpayer could be quite large.

Exports of agricultural products are also an important source of national well-being. They enable us to capitalize on the comparative advantage represented by our unusual endowment of agricultural resources, in addition to the advantage we reap from efficient producers and past investments in human capital and new production technology. This past year the surplus on our agricultural trade accounts was almost \$14 billion. Agriculture has contributed a surplus to the U.S. trade account every year since 1969. In 3 of the last 11 years the surplus on our agricultural trade accounts was more than enough to offset the deficit in nonagricultural trade. The surplus in agricultural trade has been over \$10 billion in each of the last 4 years, when we have badly needed it to pay for our burgeoning import bill for petroleum, raw materials, and manufactured products.

Clearly, trade is important to any assessment of the outlook for either the U.S. economy or agriculture. The organizers of your conference were wise in putting it first on the agenda, since it sets the stage for a discussion of both the domestic economy and of agriculture. The corollary, of course, is that developments in other countries, both in terms of policies and in terms of output, are important influences on how well both our farmers and consumers will fare this next year.

I have chosen to focus my comments on four issues: (1) The multilateral trade negotiations, (2) changes in currency values, (3) the need for positive adjustment policies, and (4) interactions between

domestic and trade policies. These are some of the key issues before us as we look to the future, and will influence the shape of U.S. agriculture in the years ahead.

THE MULTILATERAL TRADE NEGOTIATIONS

Had things worked out as expected my paper might have been directed almost exclusively to these negotiations and their implications for agriculture. After 4 years of rather protracted and difficult negotiations, this ambitious effort was to have been wrapped up by last July 15. Things didn't work out that way, of course, and the next target date is December 15.

Given the sensitivity of the issues being negotiated, the wiser strategy for me might well be to sidestep these issues completely. But due to the importance of the MTN to the current policy perspective, I have decided to address at least some of the general issues.

The first and perhaps foremost point to be noted is that in the current round of discussions an effort has been made from the beginning to make agriculture an integral part of the negotiations. In the Kennedy round, agriculture was negotiated on a separate track, with the result that at the last minute the overriding difficulties with this sector caused negotiations to be closed with little progress on agricultural issues. This time the U.S. Government has repeatedly stated, "No progress in agricultural matters, no MTN."

U.S. strategy on agricultural trade has focused on two main objectives: (1) A reduction in both tariff and nontariff barriers to trade, and (2) an attempt to establish stronger rules of the game on trade matters. The latter has had two main elements: (a) Attempts to agree on rules that will provide more discipline on policy measures such as export subsidies, and (b) attempts to negotiate commodity agreements, with the emphasis, of course, on an International Wheat Agreement.

In attempting to obtain trade liberalization per se, principal interest has focused on the complex bundle of issues among industrialized countries. A similarity of climate among these countries causes them to have a broad overlap in commodity mix which intensifies agricultural trade disputes. This problem is exacerbated by the tendency of advanced countries to protect their agriculture, and to deal with the income problem of that sector by means of interventions in the product markets. The European Community's common agricultural policy is a prominent example of such protection, but we do the same thing with dairy and sugar and a few other commodities.

The conflict between the EC and the United States has been particularly acrimonious, and is a continuing source of friction and political difficulties. For our part, we would like to have greater access to the Community's markets. But the problem is not just one of access. With product prices set above market clearing levels the Community often has to resort to export subsidies to dispose of the surpluses it produces as a result of those high prices. These subsidies tend to be disruptive of our own markets and are viewed as unfair competition by our producers. We have lost a large portion of our Middle East markets in poultry because of these policies, and this year once again find our grain markets threatened by subsidized exports from the Community.

Protective measures give rise to other problems as well. The use of quotas and other nontariff barriers to trade, and such policies as the variable levy as practiced by the European Community, in effect isolate national and/or regional economies from market forces. When combined with export subsidies, these policies impose a great deal of instability on international markets because they reduce the scope for market forces to work, while at the same time imposing additional shocks on the system.

Market instability, of course, gives rise to pressures for further intervention in self-defeating attempts to protect domestic agriculture from external shocks. It also generates strong incentives for self-sufficiency, which leads to inefficient use of resources and a reduction in longer term potential for trade.

One can easily despair at obtaining trade liberalization among industrialized countries, since the battle has been long and progress at times quite fitful and slow. But the alternatives are bleak indeed. As a relatively open economy, our consumers and producers bear a disproportionate share of the instability in international commodity markets. This instability poses a threat to our own domestic policies and to our own stance in favor of freer trade.

Equally as important, failure to make progress in liberalizing agricultural trade poses a threat to the relatively open trade we have in industrial products. In fact, a very real danger we now face is the threat posed by the urge to retaliate by becoming more protectionist on industrial products. Such policies would undo the considerable progress we have made in liberalizing trade in industrial products in the post-World War II period, and cause us to sacrifice the very real gains we have realized from such trade.

The attempt to negotiate international commodity agreements is an important element in our attempts to obtain better functioning international markets. We have signed an International Sugar Agreement, although Congress has not yet ratified it, and are actively engaged in negotiating an International Wheat Agreement.

Commodity agreements are not directly trade expansionist. But if they are successful in adding stability to international markets, their longer run effects can be in that direction. Supply assurance reduces the incentive for high-cost self-sufficiency.

In the case of the proposed wheat agreement, our goal has been to obtain a wider sharing of the adjustment burden to changing conditions in the market. In the past, the United States has been forced to bear a disproportionate share of that burden. Hopefully, an agreement will establish mechanisms for a wider sharing of the burden.

The past record with international commodity agreements causes many to be less than sanguine about their efficacy and longevity. One cause of the past failures, however, has been the establishment of agreements that are too ambitious. In the agreements now under discussion, the goals have been kept rather modest. The attempt is to obtain concerted actions in a flexible way, with buffer stocks providing the means to offset short-term fluctuations in market forces.

The final element of the trade negotiations is the attempt to establish well-defined rules for trade interventions. The effort here focuses on rules for the evaluation of products by customs, rules for government procurement, safeguards, export subsidies, and countervailing

duties. The latter two are probably the most important from an agricultural standpoint. Export subsidies are extensively used for agricultural products, and countervailing duties are the logical counter-measure. Agreement on rules that provide some discipline in the use of these measures can limit the extent to which they are used and reduce the often capricious way in which both are implemented. Success in this endeavor will reduce both the frequency and size of shocks to international markets and thereby add to stability.

CHANGES IN CURRENCY VALUES

Discussions of monetary exchange rates have dominated the news this past year as the dollar has fallen on international markets. Exchange rates are important since they influence the extent to which a country realizes its comparative advantage in international trade. Interventions in foreign exchange markets are an important means of taxing or subsidizing agriculture, and can be an important source of disturbances to international commodity markets. By the same token, changes in the exchange rate can be an important means by which changing conditions in international markets are transmitted to the domestic economy.

To understand the role of exchange rates, it is important to recognize that distortions in these rates are equivalent to explicit tariffs and subsidies. Trade theory teaches us that a correct measurement of trade intervention must take account of both the tariff or subsidy and the degree of distortion in the exchange markets. Perhaps the best way to understand this is to recognize that an over-valued currency is a subsidy on imports and a tax on exports, while an under-valued currency is equivalent to a subsidy on exports and a tariff on imports.

Despite this equivalence between distortion in the exchange markets and interventions in trade, exchange rates have received little attention in the current round of trade negotiations. However, the United States does favor floating exchange rates, and has defended such a policy in international fora. Its belief in the efficacy of such a policy may be one of the reasons for neglecting it in trade discussions, although history amply demonstrates how important distortions in exchange rates can be.

A number of issues involving exchange rate policies are now before us. Perhaps most important is the persistent decline in the value of the dollar. The dollar's sharp drop in recent months has increased the cries for protectionist measures in other countries. The problem here is not only the improved competitive position that such a decline gives the United States, but the advantage it gives to countries that keep their currencies tied to the dollar. Hence, Germany and other European countries face not only stronger competition from the United States, but competition from Brazil, Mexico, and South Korea as well. When inundated by goods from these countries, at the same time that their own export industries experience reduced demand from abroad, the appeals for protection are understandable. But these pressures make trade liberalization quite difficult, and may eventually prejudice the multilateral trade negotiations.

The fall in the value of the dollar also poses a threat to international capital markets. These capital markets have become an important

instrument of economic intercourse, and are increasingly a means by which nation-states finance their economic development. But the sharp decline of the dollar has created substantial problems for banks, insurance companies, and other financial institutions. The losses on their dollar assets have in some cases been huge, with the result that the perceived risk in these markets is now larger.

The decline in the value of the dollar may also be giving false signals to U.S. agriculture. It seems clear that the strength of our agricultural exports this past year is due in no small measure to the fall of the dollar. If the new rates are in fact equilibrium values, all will be well and good. But if the dollar is now undervalued, as many believe, these strong export markets may be in part an illusion. As the dollar recovers to its equilibrium level, a rather sizable adjustment problem may be forced on the agricultural sector.

The dollar's decline has also made the present and recent participants in the Common Market "snake" more desirous of using that device to insulate themselves from the gyrations of the dollar. The "snake" is a scheme whereby the currencies of the six member countries are linked together for a common float against other currencies. Each member currency is supposed to hold within $2\frac{1}{4}$ percent above or below its fixed level against each other currency, but the bloc of currencies is free to float against outside currencies.

Because of the fluctuations of the dollar, discussions are now underway to create an eventual European Monetary Union with a common currency managed by one central bank. The difficulty with this proposal is that it has the cart before the horse. There are as yet no clear arrangements for pursuing a common economic policy. Moreover, there are substantial differentials in the rates of inflation among the proposed member countries. Under these conditions the stability of the new European currency unit will require sizable interventions in exchange markets. Such interventions will tend to generate world inflation and damage sound monetary and fiscal policies followed by other countries. This in turn will nurture protectionist sentiments and the desire to be isolated from international market forces.

If such a common currency could be established it might have a salutary effect on U.S. policy. The emergence of a viable competitive currency might impose a discipline on U.S. economic policy that was lost when the value of the dollar was severed from gold. But whether this ambitious scheme can be realized remains to be seen.

A more likely longer term solution to the problem of international monetary disturbance is the establishment of a true world bank. Such a bank would provide for the world the same functions that central banks provide for individual countries. It would manage the world stocks of money, hopefully in a sound fashion, and provide the means whereby individual countries would deal with their balance-of-payments problems. Although the International Monetary Fund is a world bank of sorts, we are still a long way from having a true central bank function.

The final exchange rate issue for agriculture is the emergence of the Green Currencies in Europe. These currencies constitute a multiple exchange rate system whereby members of the European Community were able to back away from the common prices for agricultural products that in the beginning were a central element of the Common Agricultural Policy. All but one of the nine member countries (Den-

mark) now maintain an exchange rate for agricultural products that is different than the exchange rate for trade in other products and for financial transactions.

The significance of these exchange rates for U.S. agriculture is that they have reduced the incentive for adjustment within the Community. Any delay in making that adjustment only furthers the day when trade liberalization will come to the Community, with the attendant advantages discussed earlier.

THE NEED FOR POSITIVE ADJUSTMENT POLICIES

Positive adjustment policies are a much neglected aspect of trade policy. The concept itself is straightforward. Efficient trade benefits society as a whole, with larger exports financing a higher rate of economic growth in the aggregate and imports providing lower cost goods to consumers and cheaper raw materials to the producer sectors. The problem is that these benefits are widely dispersed in society, while individual sectors in the economy may be harmed by low-priced imports. Efficient policy would require that resources be transferred from those sectors that are no longer competitive to those where their contribution to society is higher. These adjustments give rise to the international division of labor which plays such a prominent role in trade theory, and which is the source of the gains from trade. Moreover, the gains from trade to society at large are expected to be sufficiently large that resource owners can be compensated for their adjustment costs in transferring from the sectors that cannot compete with lower priced imports to the more productive sectors.

So much for principle. In practice, the problem is a great deal more difficult. Few people like to leave their chosen vocation or profession, especially if the need for adjustment comes late in life. Hence adjustment programs are often referred to disparagingly as "burial expenses."

Similarly, there are serious questions about just how far the international division of labor should be allowed to go. Legitimate questions about national security are raised when a nation's steel industry threatens to go down the tube, or when the United States sees an important share of its electronic industry transferred to other lands. Countries such as Japan, which now imports more than 50 percent of its caloric intake, reasonably ask just how much further they should go in becoming more dependent on other countries for their supply of foods, just as many in the United States question how dependent we should permit ourselves to become on foreign sources of petroleum.

Two problems complicate the adjustment process. First, the transfer of labor is more difficult when the economy is operating at less than full employment. And in fact, an important source of the growing pressures for protectionism in recent years is due to the sluggish growth in the industrialized countries and the relatively high rates of unemployment. Unfortunately, this sluggish growth has occurred at the same time that there has been a major realignment of exchange rates, and with it some major shifts in competitive advantages. Competitive threats from foreign countries have become more severe at the precise time that countries find it more difficult to make the necessary shifts in their domestic economies.

The second complicating problem is when foreign competition threatens a sector that inherently faces adjustment as development

proceeds. This is the case with agriculture and helps to explain why trade interventions tend to be more severe for this sector of the economy than they do for others. The nature of the development process is such that labor resources typically have to be transferred from agriculture to other sectors as development proceeds. This adjustment process can be difficult in its own right, as our own historical experience amply demonstrates. When a trade adjustment is placed on top of that "development" adjustment, the problem can be doubly severe.

This perspective can help in understanding the high protective barriers the European Community has put around its agricultural sector. Member countries have been in that stage of their development that required a net reduction in their agricultural labor force, especially in light of the existing potential for technological modernization. In the case of the EC, this problem has been exacerbated by what are referred to as structural factors. As in the case of the United States in the late 1950's and early 1960's, the owner-operators in agriculture have been older than the rest of the population due to the selective effects of past outmigration. More importantly, however, land holdings in member countries are particularly fractionated and dominated by small parcels. When combined with the particular attachment to land ownership that characterizes Europe because of political instability over the years, the adjustment problem has been especially difficult.

Unfortunately, the Community missed a golden opportunity to deal with this adjustment problem during its post-World War II economic boom. When demand for labor for its expanding nonfarm sector was growing rapidly, it opened its borders to migrant labor from other countries in order to alternate wage pressures. In the absence of such policies, outmigration from agriculture would undoubtedly have been greater and a more rapid reorganization of agriculture would have taken place. The demands for protectionism would in turn have been substantially less.

Devising innovative means to deal with the adjustment problem, both here and abroad, is the key to obtaining further significant gains in trade liberalization. Many of these policies have to be devised nationally to suit local conditions. They will need to focus on the labor markets, but in some countries of the EC they will have to deal as well with rather difficult land tenure problems.

In addition to these national policies I believe there is also a place for international cooperation in dealing with the adjustment problem. Elsewhere I have suggested the creation of an International Adjustment Fund that would help finance projects designed to facilitate the adjustment process. The rationale for such a fund is that the world at large benefits from freer trade. Yet an individual country finds it difficult to internalize the political tradeoff from such trade since the economic exchange is seldom perceived as between domestic producers and consumers, but rather as a loss by domestic producers to the benefit of foreign producers.

Resources for this fund would come from individual countries, perhaps based on their GNP since this would be a reasonable proxy for consumer benefits. Use of the funds from this source would be an application of the well-known compensation principle of welfare-

economics fame. Its strength would be the use of international funds for solving what is perceived as an international problem.

LINKAGES BETWEEN DOMESTIC AND TRADE POLICIES

In my opening comments I noted that our domestic agricultural commodity programs were predicated on strong exports markets. However, the maintenance of strong exports markets is equally dependent on maintaining appropriate domestic policies. Domestic policies that price our commodities out of international markets can alter our trade situation rather significantly.

Fortunately, both the 1973 and the 1977 Food and Agriculture Acts took long strides in giving us domestic commodity policies that help us to remain competitive in international markets. The establishment of broad price corridors for products that are important in international trade is an important example. Market forces are allowed to work within these corridors with the result that there is less of a tendency for us to price ourselves out of foreign markets.

The growing separation of income policies from commodity policies is another positive aspect of the policy framework. The use of the target price concept permits market prices to seek their market-clearing levels, within the limits of the price corridor, and income problems are dealt with by means of direct deficiency payments to producers. Through these mechanisms our products remain competitive in international markets.

Finally, the farmer-held reserves provide buffer stocks that give us a reasonable change of remaining a reliable supplier to foreign countries, and make some contribution to developing more stable international markets. This increased stability reduces the incentive for self-sufficiency on the part of other countries. The turning away from self-sufficiency provides more market potential for us and other exporting countries in the future.

Although domestic policy has evolved in the direction of making us more competitive in international markets, there will be continuing difficulties in preserving that policy framework. Farmers will perceive a strong link between the prices they receive and their incomes. The political pressures to raise the loan level and with it market prices will be great. Similarly, it remains to be seen whether it will be possible politically to trigger the farmer-held reserves into the market when prices rise.

To summarize, the U.S. political process has evolved a unique set of domestic commodity policies that facilitate international trade in agricultural products. Whether those policies will be used remains to be seen. It is one thing to acquire stocks when prices are low. It is quite another to release them back into the market when prices are rising. Only time will tell whether we will make appropriate use of the policy instruments we have available to us.

CONCLUDING COMMENTS

Trade issues are likely to become increasingly important as we move into the remainder of this century. We are living through a period in which many people, both in this country and elsewhere,

would like to turn inward. I doubt whether that is in the cards. With all the progress in communications and transportation the world has just become too small for isolationism to persist for very long.

One of our major challenges as educators is to help U.S. citizens overcome their fear of development and progress in other countries. The recent emergence of competitive threats from countries such as Brazil, South Korea, Taiwan, and Singapore has given rise to demands that we limit our technical assistance to other countries and that we reduce our foreign aid budget even further than we already have.

To do that would be extremely shortsighted. Our prosperity will be determined in large part by the economic progress in other countries. A retreat to Fortress America is no longer a viable alternative.

To date we have tended to wish the North-South dialog would go away. It won't. And although we may not have another formal round of multilateral trade negotiations, the low-income countries will most assuredly force their issues on to our agenda. Our trade dialogs of the future will most likely be with those countries, and not with the developed countries.

USDA PERSPECTIVES ON FOOD AND AGRICULTURAL POLICIES

(By Howard W. Hjort, Director of Economics, Policy Analysis and Budget, USDA)

Earlier today I had the privilege of welcoming you to this 55th annual Outlook Conference. This afternoon I want to review with you the state of our food and agricultural policies.

THE FOOD AND AGRICULTURAL POLICY AGENDA IN JANUARY 1977

Permit me to begin with a review of the policy agenda in January 1977:

The legislative authorities for all the major farm programs were expiring.

The natural disaster programs were characterized by the Secretary as "a disaster."

USDA's farm credit authorities were inadequate and in need of modernization.

Our food and agriculture research charter needed to be clarified and updated.

Several health and safety issues and environmental concerns remained either to be resolved or addressed.

The legislative authorities for the major food assistance programs, both domestic and foreign, were expiring.

International understandings on food aid and food security remained to be agreed upon.

Understandings and rules with respect to international trade in general, and especially with respect to several key commodities, were in the process of being renegotiated.

THE SITUATION AND OUTLOOK IN 1977

As this agenda makes evident, no administration in recent memory had as great an opportunity to influence the direction of food and agricultural policy. And seldom had the need for doing so been more evident:

The meats sector of the agricultural industry was in a state of depression, especially the beef cattle component, the consequence of previous events and policies.

Declining commodity prices, combined with increased production costs, were moving the crops sector, especially wheat and feed grains, toward recession.

Farm credit problems were on the horizon.

Those who relied upon our farm products, both at home and abroad, were vulnerable to repeated episodes of rapid price run-ups and refueled inflation if adverse weather patterns again occurred.

Uncertainties over the final resolution of health and safety, environmental, and international issues were causing postponement of actions in the private sector that were needed for future growth of the food and agricultural sector.

THE POLICY CHALLENGE

In this situation it was necessary to define policies that recognized the changed environment for agriculture and food—the increased importance of foreign markets, the increased contribution of exports to the Nation's trade balance, and the increased impact that agricultural instability transmitted to the entire domestic economy.

We are the world's largest agricultural exporter. The populations of most of the continents look to the produce of our farms for an enriched, more varied diet. Just as the past has shown that the world has become increasingly dependent upon North America for food, the future, with an ever-widening gap between production and consumption in the rest of the world, will undoubtedly see that dependence increase even further.

Conversely, we look to the world for our markets—important for farm prosperity and critical for paying for energy and the other things we import. Yet, while agricultural trade is important, it is a small part of total world agricultural production. Thus, a small variation in world food production sometimes translates into greatly amplified variations in world trade and even greater variations in the quantity and value of U.S. exports.

In the absence of policies and programs that recognized these basic facts, the American farmer and consumer would continue to be whiplashed by events throughout the world.

In addition to the need for our policies to incorporate the necessary flexibility to respond to and compensate for changes in policies of others and in world economic and weather conditions, it was essential to recognize the interdependence of our different economic groups—between farmers, consumers, and taxpayers, and between livestock and crop producers, and among crop producers, in an attempt to treat all participants equitably and to balance the costs and benefits to society.

Our goals for producers and consumers included reducing the extreme fluctuations in agricultural markets which undermine economic security. Our producers needed a more adequate level of price and income support, improved risk protection against natural disaster, greater flexibility in adjusting production under farm programs, more marketing options, and continued growth of export markets.

RESPONSE TO THE AGENDA

The administration and the Congress responded to the pressing need for legislative action. The Food and Agriculture Act of 1977 and the Emergency Agricultural Act of 1978 were passed, providing legislative authority for all the major farm programs for the next 4 years.

The disaster programs authorized by the 1973 act were amended and extended for 2 years only, to give the administration time to develop and the Congress time to consider a comprehensive insurance program.

The Agriculture Credit Act of 1978 made a number of changes to modernize farm credit programs. It increased the maximum amounts for insured farm ownership loans from \$100,000 to \$200,000 and for insured operating loans from \$50,000 to \$100,000. It also provided for interest rates to cover the Government's cost of obtaining money and authorized a \$4 billion economic emergency loan program to provide operating credit to farmers and ranchers who are unable to get credit from their usual sources because of recent low prices.

A new and broader charter for food and agricultural sciences, confirming USDA as the lead agency for research, extension, and teaching was included in the 1977 Food and Agriculture Act. This renewed charge from the Congress further supports our task of assuring an adequate, safe, nutritionally balanced diet for all Americans.

Health and safety issues and environmental concerns have been under thorough examination by the Department and others. However, many remain on the agenda, waiting for their most viable resolution.

The Food and Agriculture Act of 1977 reauthorized the food stamp program, and redefined it to improve its efficiency and direct increased benefits to those most needy. Further, the Child Nutrition Act of 1978 signed November 10 authorizes a significant expansion in the women, infants, and children food assistance and child-care food programs. It also gives increased incentives for participation in the school breakfast program.

Foreign food aid is also addressed in the 1977 Food and Agriculture Act, allowing modification in the Public Law 480 programs so that aid can be targeted to those countries where it is needed most.

International understandings of food aid, food security, and trade are presently on our agenda. The International Sugar Agreement was developed. The Agricultural Trade Act of 1978 was passed giving new authorities for trade initiatives. International discussions on other trade matters are currently being conducted and we are participating.

THE STATE OF FOOD AND AGRICULTURAL POLICY

These steps taken in the past 2 years have given form to a comprehensive set of domestic and international food and agricultural programs which can meet the changing national and global needs.

Our basic legal authorities with respect to market support and target prices, and those that permit us to encourage producers to withhold land from production when our stock and reserve objectives are satisfied, have sufficient flexibility to accommodate the uncertainties of the future for almost all the price-supported commodities.

Cost of production was adopted as the basis for income support (target prices). The target prices directly address the question of equity among producers of the major crops by using a comparable level of income support.

Market price supports—loan rates—were authorized and established at levels that permits our products to remain competitive in international markets.

No further legislative action is needed to either adjust target prices up or loan rates down—our current authorities were designed to allow for such remedies. They also give the flexibility to adjust production to needs through any combination of set-asides and diversion programs.

It may be that future events will justify relatively minor amendments to existing authorities for some commodities such as extra-long staple cotton, rice, milk, peanuts, and one or two minor commodities. But, with the exception of sugar no adjustments appear to be necessary at this time.

In the case of sugar, ratification of the International Sugar Agreement, and enactment of the necessary implementing authorities associated with that agreement, together with new authority for a realistic domestic sweetener policy remain to be obtained.

A reserves policy was adopted as the cornerstone of the Carter administration's food and agricultural policy. The farmer-owned reserve program gives producers another marketing option. Supplies in excess of market requirements are placed in reserve, which tempers the decline in prices. Yet, between the market support prices and the resale prices for governmental stocks, commodity prices reflect the fundamental conditions of the market.

Producers retain ownership of the grain placed in reserve and will be the beneficiaries when prices advance. At the same time, the reserve gives us greater flexibility in responding to a world food crisis without international or domestic chaos or sharp run-ups in food prices. With reserves we can be a more dependable supplier and the likelihood that our feed prices will again put the American livestock sector through the economic wringer is significantly reduced.

Our stocks and reserves policies are being implemented. Our stock objectives are geared to the necessity of our being a reliable supplier to domestic and foreign buyers and to what we perceive to be our "fair share" of world stocks. Our wheat stock objective represents about 7½ percent of world use. For feed grain, we believe stocks equivalent to be about 6 percent of world use is adequate.

In reviewing the outlook for the current marketing years, it appears that our feed grain stocks next fall will be in excess of our objective, we may be in the same position for rice, but for the other commodities it does not appear that stocks will be excessive. In the absence of the setaside and diversion programs we would find ourselves in a position of holding excess supplies of wheat as well as feed grain.

Our reserve programs appear to be successful. The farmer-owned component of the wheat reserve has been oversubscribed. We believe the rice reserve target will be met. We are not, unfortunately, in a position to assure that we can meet our food aid commitments, but this matter will command priority attention with the 96th Congress. Another near 3 million tons of wheat is destined to be placed in reserve for use in connection with our food aid commitments.

It now is clear that our feed grain reserve objective will be realized but more than initially desired is likely to be in Government ownership. We are prepared to develop farmer-owned reserve programs for other commodities such as cotton and soybeans if the situation provides justification for such programs. It does not at present.

The major unfinished business with respect to the domestic farm programs is the necessity to replace the present disaster programs with a comprehensive insurance program. This will be a high priority matter during the 1st session of the 96th Congress.

Our farm credit authorities have been updated and expanded in a manner that permits us to be far more responsive to the credit needs of our agricultural producers. No further amendments to these authorities appear to be necessary.

The administration supports a countercyclical concept to govern the importation of meat into the United States, but the measure containing such a formula could not be signed due to the restrictions on access and the President's authority. We are prepared to work with the new Congress to complete action on this matter, but will administer either the 1964 act or one in a countercyclical manner.

Meat prices have risen rapidly, mainly the consequence of past food and agricultural events and policies. Meat supplies will be relatively tight and prices relatively high, but we believe that the feed policies and programs together with current supplies and reserves are adequate to result in orderly and balanced growth between the livestock and crops sectors.

Our major domestic food assistance program has been modified to eliminate the purchase requirement and this new policy is soon to be implemented. Recently approved legislation significantly expands the women's, infant and children food assistance program which, according to all available evidence, appears to be a very effective way to improve the nutritional status of program participants. The continuing future task will be to follow policies with respect to the domestic food assistance programs that will maximize our contribution to nutrition objectives. We have been and will continue to be in a situation where it is necessary to minimize Government expenditures and this will require reductions in less effective programs to make room for those that are more efficient and effective.

There are a number of health and safety issues that remain to be resolved, among them the use of additives in livestock feeds, sulfa residues, nitrites and nitrates, and grading and labeling issues. Many of these issues have remained unresolved too long and the uncertainty associated with not knowing how they are to be resolved in some cases may be creating greater problems than the issue itself. The important task is to get these issues resolved but not before assuring that all interested parties have full opportunity to participate in the decision-making process.

International discussions are underway on a new food aid convention but this matter—as well as the entire question of the Carter administration's role with respect to eliminating world hunger—remains to be resolved.

The International Sugar Agreement remains to be ratified by the United States and a new international wheat agreement with its mainstay an international reserve of wheat stocks remaining under member-country control, is, hopefully, in the final process of being negotiated.

The multilateral trade negotiations are in the final process. Here the major objective is the reduction in barriers to trade such as tariffs, multilateral codes and subsidies, and improvements in international trading rules.

Expanding our export markets for agricultural products has remained high on the policy agenda. The quantity of short-term credit available in fiscal year 1978 was increased to \$1.7 billion, almost double the amount of the previous year, and will remain high this year. The market promotion program has been granted the highest priority for additional funding and we opened our first overseas trade office earlier this year.

Our agricultural exports will also be given new emphasis by the Agricultural Trade Act of 1978 which directs the establishment of 6 to 20 more trade offices in major markets. These will be established as

justified. And under the same act, we now have authority to extend intermediate export credit for breeding livestock, the building of grain reserves by developing countries as a part of an international agreement such as the IWA, and for construction of market facilities abroad. This 3- to 10-year credit program supplements the short term CCC export credit program and the long term Public Law 480 programs. The use of this authority for the construction of market facilities will be used only when it is evident that other authorities cannot adequately provide the necessary credit.

There are several other matters that remain upon the agenda. In the present situation inflation is the No. 1 problem facing American agriculture. Farm production costs continue their persistent move upward. These costs, determined by the prices of nonfarm inputs that farmers have to buy, tend to move up with the general rate of inflation.

But it is not only inflation in the general economy which continues to escalate the costs of producing food at the farm level—inflation is felt throughout the entire food system. And because we are in a situation where nearly 70 cents out of every dollar that is expended at retail goes to pay for the services associated with bringing those items from the farm gate to the checkout counter, inflation will be the major source of the continued increase in what we pay for food at retail.

We in the food and agriculture sector have a vested interest in the effort to reduce price inflation. USDA will work with the Council on Wage and Price Stability in monitoring food and fiber prices at the retail, wholesale, and farm levels, with a view toward the identification of the sources of upward price pressures within the food and agriculture sector and the identification of measures that can be taken to reduce such pressures.

While our agricultural system has the capability to meet increasing world demands for food, our agricultural transportation system appears to be pushing capacity and showing signs of strain. It just may be that the most effective constraint to the rest of the world being able to satisfy its consumption requirements in the near term may be due to an inability on our part to transport it to ports and load it on ships. This concern is moving higher on the policy agenda.

There are other issues moving onto the food and agricultural policy agenda. Among them is the overall question of the future structure of American agriculture. There are serious questions that will be addressed over the use of land and water, over landownership patterns, over taxation policies, and their implications for the structure of American agriculture.

In summary, many food and agricultural policies of the Carter administration have been put in place, but there are several that remain on the agenda. Most of these will be resolved and implemented before the next Outlook Conference, but some will remain to be addressed. In the meantime, new ones will move onto the agenda.

In conclusion, the state of American agriculture is decidedly better today than it was when you came to this conference a year ago. While this improvement certainly is not entirely due to the food and agricultural policies that have been implemented over the past 22 months, those policies clearly have been the source of some of the improvement. As others on the agenda are approved and implemented they also will have a positive impact. It is our hope that the state of our food and agriculture industry will be better when you return a year from now.

USDA ECONOMIC PERSPECTIVES ON NATURAL RESOURCE ISSUES

(By Lawrence W. Libby, Coordinator for Land, Air, Water, and Solid Waste,
Office of the Secretary, USDA)

Virtually all natural resource issues within the Department are economic. That is, any policy choice implies a dollar cost, foregone opportunities of some type, and distribution of monetary and non-monetary consequences among interested parties. No good economist could deny the ubiquity of the economic paradigm. Having made that necessary but totally useless observation, I will now attempt to focus on a few resource issues of interest to this group.

There are two caveats. First, when I say economics I do not mean just business, or monetary exchange. I am speaking of the process of choice based on anticipated "price" or consequences of alternatives. Secondly, my purpose is to broadly address natural resource issues of current priority to the Department. I do not intend to represent the Department in proposing new policy directions; rather, I am verbally analyzing the existing situation as I see it. My list is selective, including those which I feel are most important and may be of interest to this group.

There appear to be three overriding economic concerns relative to natural resource programs of the Department. They are neither discrete nor all-inclusive categories, but separable for discussion purposes. First, there is increasing pressure for systematic measurement of economic performance of natural resource programs. Congress, the White House, and Department policy leaders are demanding evidence of return for public dollars spent on resource objectives. This is not an idle question for the Department right now, I assure you. It is being asked more vigorously than ever before, I am told. These demands are in a current nationwide policymaking which includes zero base budgeting and Proposition 13. Pollsters tell us that taxpayers are concerned less about size of the public than the way those public dollars are spent. The latter is the primary concern here, but the former is a silent partner. There are several specific cases at issue right now:

1. Request by the Senate Committee on Agriculture, Nutrition, and Forestry and the General Accounting Office for careful evaluation of land and water conservation programs. There are several questions, but the bottom line is, do conservation programs make a difference? Further, are there less expensive ways to achieve specified conservation objectives? These are complex questions, but must be addressed. They currently occupy the attention of some of the best analysts in the Department.

2. A similar request has come from the White House concerning performance of those conservation practices receiving cost-share assistance under the ACP program. Answers here will be helpful for the

broadier analysis noted above. Further, the Resource Conservation and Development (RC & D) program is under scrutiny. Is nothing sacred?

3. Analysis of program performance is a key part of longer run agency operations under the Resource Conservation Act (RCA) and Renewal Resources Planning Act (RRPA). Both place major new emphasis on careful appraisal of existing land, water and forest resources, and documentation of economic consequences of options considered to achieve identified policy objectives.

4. A complete evaluation of Extension is mandated under the Food and Agriculture Act of 1977. Again, the question is, what are the demonstrable impacts of dollars spent on nonformal education of all those people assumed to be part of the agricultural or rural constituency? I need not spell out the difficulty of even specifying that question, to say nothing of answering it.

In all of these, input and intermediate outputs like feet of tile installed, farm plans completed, families consulted for nutritional needs are easier to measure than the final products. There are few precise answers to these performance questions. The effort to answer them is worthwhile, though. It should lead to design of information systems that focus on meaningful choice, not just incremental adjustments to last year's program.

A second major economic dimension of USDA resource policy concerns direct management of land. Over 187 million acres of land are managed by the Forest Service on behalf of the citizens of the country—"the greatest good for the greatest number," and all that. Some forest and range outputs are priced and sold, others are not. The challenge for the Department is to approach an appropriate balance among these priced and unpriced commodities, with knowledge of all of the implicit costs. I use the phrase "approach a balance" advisedly. There is no consensus balance among timber, wilderness, developed recreation and other forests outputs. Some policy analysts may wish it otherwise, but interest leaders know better. Recent public land legislation and implementing rules have pushed economic criteria more forcefully into the management process. Proposed rules implementing the 1976 National Forest Management Act define as not suitable for timber production those lands not needed to meet multiple use objectives of a regional plan and "inefficient" for timber production. That is, timber should return in revenue and other benefits at least what it costs to prepare it for sale. That principle has been fairly broadly accepted as one of several management criteria. Differences have arisen as to the appropriate unit for analysis. Without getting into the specifics of this continuing issue, some would prefer that the efficiency test be applied to specific sites or acres, while forest managers tend to prefer retaining management discretion for the whole national forest. At issue, of course, is the appropriate "price" for timber withdrawal, and "price" for harvest. Some of these economic consequences are captured in dollars, others are not, but every decision has a price. Income and revenue foregone when lands are withdrawn from harvest are more obvious than social opportunities lost when a major timber cut is made. The price in the latter case is surely sloppier—it could not be otherwise—but it is no less valid when public interest is involved. There are clearly regional differences in the impacts of these management choices. Timber revenue is a crucial part of the local economic base in many areas.

Various environmental rules are being injected into the management of public land. While inevitably sources of frustration for the manager, these rules represent efforts to acknowledge certain risks and nonmonetary values implicit in management choices. Current examples include protection of archeological, historical, and cultural features of the landscape; caution in use of certain pesticides; protection of endangered species. While not overtly economic in intent, these new rules acquire economic meaning as limits on available choices.

The third major economic perspective on USDA resource policy concerns the economics of information. Without tiresome discussion of conceptual notions involved here, I would simply observe that information is costly. We must have accurate, timely information on consequences of decisions in Government. Few would argue otherwise. At the same time, we must be sensitive to enormous costs involved, for ourselves and for others affected by public rules. Further we must keep in mind the well-known economic axiom that at some point the additional bit of information is likely to cost more than it gains us in "improved" choice. This is a fascinating topic, to me anyway, but probably not terribly appropriate for this meeting.

Beyond these three overview topics, economic perspectives on natural resource issues may be categorized by type of resource. Each of these has elements of the three perspectives discussed above, but also has unique subject content worth noting. The list cited here is certainly not all inclusive:

1. *Agricultural lands*.—There is little doubt that land is going out of agriculture. Some land is being added to agriculture also, but the net effect is negative.¹ The next question from a national policy standpoint is "so what?" Most of the land shifts are internal to production processes, as farmers and other economic factors adjust to markets and longer run economic conditions. These shifts haven't hurt our total production—in fact, we are engaged in various policies to counter the economic affects of overproduction, as noted by our previous speaker. Some shifts result from needs for development space, for housing, industry, et cetera. These uses nearly always mean higher return per unit of land, a condition generally associated with progress. Still no real problem, though some might argue that as consumers we demand more living space than we really need. The real policy issue in all of this concerns the economic and social pain associated with transition of use. Market signals are poor indicators of real effective demand for land. There is often rampant uncertainty at the rural fringe regarding the pace and pattern of development. The result is loss of good farmland far beyond our demand for other purposes. Further, the State and local economic base may decline as agriculture slips away by default, with little or nothing to take its place. A farmer may bank more on the possibility of selling land at a high price than on his future in farming. States and local governments have developed programs to guide development in patterns sensitive to relative productivity of agricultural land, and public costs of scattered development. They know that Federal actions of various

¹ Data indicate that about 2.7 million acres per year are converted from cropland to something else, and about 1.3 million new acres are added through expanded irrigation clearing, or drainage. The opportunities to add land are diminishing for many reasons, including environmental concerns.

kinds have contributed to the loss of good farmland beyond its conversion to other productive purpose. They also know that in many cases, the agricultural land market is a one-way proposition. That is, the transition cost from farm to some other use is far lower than cost of conversion back to farming again. The Federal role in all of this is not overwhelming but important. The Department should assure that other Federal agencies take explicit account of the economic characteristics of land taken or directly affected by their decisions. Further, USDA is the appropriate level to monitor overall economic shifts of land in and out of farming nationwide. Physical capability data are useful, but don't describe the economic availability of farmland in areas where agriculture has a chance for survival.

So there are relevant economic dimensions to the agricultural land retention issue, and I would argue, economic rationale for a public role. Other levels of Government have recognized a role and have acted. USDA must not get in their way, but can provide a national overview.

2. *Water policy.*—One of the President's goals upon taking office was to look closely at Federal spending for water resource development. Studies of Government investment in water programs is not new. Indeed there are few areas of public investment in which benefits and costs have been studied so carefully. Since 1973 most Federal agencies, particularly those providing flood control and irrigation have operated under the principles and standards for water resource planning. The principles and standards provide guides for the evaluation of planned water resource projects, specifying that costs and benefits must be estimated in terms of national economic development (NED) and environmental quality (EQ). Planners must weigh both of these objectives carefully in determining whether a project should be approved for construction. The purpose of this framework is simply to assure systematic documentation of likely impacts of Federal spending.

The present administration's attempts to make changes in water policy have been widely documented in the popular press and in more scholarly journals and reports. The water policy study in 1977 developed staff papers on evaluation standards, cost-sharing, institutions, Federal reserved water rights, water conservation, water research, and water quality. This year the President sent to Congress his water policy initiatives. He also directed the agencies of the executive branch to give greater attention to a number of reforms in water resource policy. Given particular attention are needs for water conservation and emphasis on nonstructural measures for reducing flood damages.

Water conservation is particularly important in agriculture, because of the high proportion of water used on irrigated farms and ranches. An interagency task force is now in the process of making recommendations on methods of increasing irrigation efficiency. But this is not an easy task. There may be production efficiencies in substituting water for other factors of production, like labor or capital, but that takes expensive irrigation equipment and other management shifts.

Changes in cost-sharing policies for water projects have been in the offing for some time. Cost-sharing for nonstructural measures for flood damage reduction was authorized during the previous administration.

The President's water policy, however, calls for revisions of the principles and standards to give greater emphasis to nonstructural measures. This could reduce the Federal outlay for dams. But nonstructural measures such as flood proofing and relocating may be just as expensive as dams, even if less visible. The dams we already have represent an important capital stock for the country. We should reconsider the mix of services that might be available from that stock. Now that cost-sharing is available for nonstructural measures, communities can make their own choice for solving various water problems.

Changes in cost-sharing policy are aimed at giving greater responsibility to the States and local communities in financing water resource development. By assuming more of the cost, these governments may also take a more active interest in the details of the projects. Preference will be given to projects where State governments agree to assume a larger share of the costs than is called for under existing cost-sharing arrangements. Private businesses, too, may expect to assume larger shares of costs. For example, charges imposed on inland waterway users are likely to be at least partly passed on to those businesses transporting goods by barge.

Depletion of ground water supplies in some areas is posing real economic problems for farmers and ultimately will affect farm-related businesses. In areas where surface water can be used in combination with ground water, the problem will be less severe. But declining ground water tables mean higher pumping costs for irrigated farms and these costs will be increased further by rising energy costs. As with any resource policy issue, allocation of water to agriculture has both economic and political aspects. One's political position on the matter is largely a function of the economic impacts. Nonfarm interests may well outbid farmers for scarce water.

Given the absolutely crucial need for water in agriculture, and increasing economic and physical scarcity of ground water supplies, combined with an extremely complex legal and institutional structure for water rights, economics of water use is likely to be near the top of the natural resource policy agenda over the next decade.

3. *Rural clean water.*—USDA has a major role in current efforts to improve water quality in rural areas. The agricultural sector has a real stake in all of this, both as a part of the pollution problem and a beneficiary of clean water. Under current rules, production agriculture and forestry are considered nonpoint sources. The strategy is to encourage changes in production practices that will reduce pollution from these sources. The key economic questions in all of this concern efficient use of the water quality dollars, and the matter of who pays for and gains from the whole effort.

The first implies setting of priorities in selecting and solving pollution problems. There is a real effort in the rural clean water program to direct the good judgment and expertise of State and local experts to the identification of water problems. Federal agencies, particularly EPA and USDA, have the broad overview but acknowledge the comparative advantage of local people to understand and cope with many nonpoint pollution problems. "Project areas" are selected and a coordinating committee established to bring appropriate agencies and local citizens together in seeking solutions. Attention is given to relative economic performance of existing means to reduce pollution. Data

on this matter are scarce, but at least performance questions are part of the action vocabulary of those involved.

The distributional questions are more bothersome with nonpoint pollution than with situations where the pollution source is more obvious. There is considerable question as to who contributes to which part of the problem. It follows then that we don't know which solutions to those problems are most efficient, and who should bear the cost. USDA and EPA have set up several test project areas around the country to try solving real nonpoint pollution problems, and monitor the process. Major reliance is on existing soil and water conservation practices on the assumption that if we prevent runoff, we will at least reduce pollution. The tests are also meant to examine how well the local, State, and Federal partners in water pollution abatement can sort out the jobs to be done, and work together. That is not a small task.

Cost-sharing is a key aspect of nonpoint solutions tested thus far. The local committee determines the most critical water problems and sets the share limits for each practice. This is done on the assumption that costs of abating an unspecified part of the nonpoint pollution problem could entail an unreasonable financial burden on an individual farmer or land operator. Further, installation of practices is voluntary in the tradition of the soil conservation program. In the upstate New York model implementation area, for example, the agency coordinating committee decided that the major water quality problem was reservoir eutrophication, caused in part by barnyard runoff from dairy farms in the watershed. The problem sites have been identified and 90 percent cost-sharing provided to install runoff containing practices. Monitoring stations are planned to test performance. We plan to compare economic characteristics of this project to similar parameters in other model areas to get at least a crude insight on economic performance.

Relying on traditional soil and water conservation practices to solve water quality problems is still based more on commonsense with a generous portion of wishful thinking than on hard evidence. In fact, a State court in Iowa recently ruled that the State law which forces a farmer to install and pay for soil conservation measures with an undetermined impact on the problem they are meant to solve, is an unreasonable restriction of private rights, and violation of the State constitution. We should not take this one case out of context, but documentation of physical and economic performance of the present list of conservation practices is of paramount importance to successful and equitable water quality programs for the future.

An important aspect of the economics of nonpoint pollution abatement is the economic setting facing the farm manager. Management discretion for the farmer is and always has been crucial to the economic vitality of production agriculture. But all private management choices, in any economic sector, are made in the context of the institutions and public rules that characterize the current political economy. We must improve water quality in this country and agriculture must acknowledge its role as part of the problem. The water quality issue will not go away, any more than the role of agriculture in balance of payments, or any other key part of the current scene. Within our current economic setting then, trade-offs will be made between water quality gains and

implicit costs to various parties. I feel that one of the most productive pollution reduction practices may be well designed and delivered policy education to help farmers, other citizens, and local decision-makers see their real choices in the current and future policysetting. People whose behavior may create and help solve water pollution problems must understand and support the process. Put more bluntly all involved must see the real economic consequences of failure to deal now with nonpoint pollution.

4. *Timber outputs.*—Forest economists and other soothsayers generally agree that demand for timber will continue to increase relative to physical supply. The usual market response expected, then, is expansion of economic supply, as timber owners offer more for sale at higher prices. There are obvious constraints to this response. The most obvious is that it takes time to grow a tree. Further, timber output from public land must be balanced with preferences for other forest outputs. Even large private holdings are increasingly subject to public scrutiny. I don't argue for or against that situation, I merely point it out.

The President has focused attention on potential of small private forests—a vast and reportedly underutilized forest resource. This Department is seeking ways to influence the economic circumstances facing the manager of small woodlots. Productivity of these lands is high, but more of that output could be reaching a useful market. There is evidence that owners of small woodlots are interested in timber management. We know that people buy woodland for many reasons, but timber output is a concern to most owners. Clearly, there are institutional and economic barriers to converting the good intentions into tangible output. Holdings are typically too small or too mixed in species to attract major markets without some sort of marketing assistance. There are risks in forest management—fire, disease, liability—that seem magnified when holdings are small. Owners may lack information on how to manage for certain species and how to minimize attendant costs. Further, the payoff from investment may be too long in coming. Recent legislation provides special focus in extension and research on “renewable resources,” including forestry. An Associate Director for Extension will be named very soon at the Washington level to add emphasis and direction to programs in this area. An updated land use policy statement for the Department will permit USDA to discourage actions that may take prime forest land for other uses. As noted with agricultural land retention, the purpose here is to maintain a positive economic climate for the manager, to encourage investment in production.

CONCLUSION

A major resource issue I have not mentioned today concerns the economics of energy availability for agriculture. Energy prices may have profound long-run impacts on structure of agriculture. Economic implications of alternative energy sources are receiving research attention through USDA and elsewhere. These topics are discussed at a later session. My omission of these matters today obviously does not diminish their importance to the Department. It merely recognizes another scarce commodity—time for this session and attention span of listeners.

In conclusion, it seems that the prevailing economic perspective on natural resource issues for this Department concerns the relationship between employment of resources in producing food and fiber, as a factor of production, and the direct "consumption" of these resources for various purposes. For example, we all have a stake in land for living space or a beautiful view, and land to grow food. The often used commodity/resource dichotomy is overused and fundamentally empty in this context. Withdrawal of land from timber harvest permits consumption of wilderness experience. Our constituency includes those who feel strongly both ways. The choice has a price—and it is the bargaining involved in setting those prices that is the heart of resource policy.

THE FOOD PRICE OUTLOOK FOR 1979

(By J. B. Penn, Deputy Administrator for Economics, Economics, Statistics, and Cooperatives Service, USDA)

I am pleased to again be a participant in the 1978 Food and Agricultural Outlook Conference. Each year, we are asked at this meeting to put our collective analytical expertise "on the line"—to present our expectations for the behavior of food prices over the coming year.

Food prices are an important factor shaping the inflation psychology of consumers. They are also a critical element in the wage-price spiral now plaguing the economy. With the implementation of the President's anti-inflation program containing voluntary wage-price standards, the behavior of food prices in the year ahead will be of special interest.

As a part of that program, the Department of Agriculture is cooperating with the Council on Wage and Price Stability (CWPS) to jointly monitor price movements throughout the food system. Our ongoing monitoring activity has been intensified, and periodic reports of our findings will be issued by the Department and CWPS.

The primary purpose of my remarks today is, of course, to discuss the USDA food price forecast for 1979. Before turning to the forecasts, however, I want to briefly review the most common measure of food prices and to quickly note food price behavior in past years to provide some perspective from which to view the outlook for 1979. Following that, I want to present the forecasts in a particular sequence—moving from an aggregate overview to the more detailed forecasts.

THE CONSUMER PRICE INDEX FOR FOOD

The most widely used measure of prices at the retail level is the Consumer Price Index for all urban consumers (CPI-U). The overall price index and its components are reported monthly by the Department of Labor's Bureau of Labor Statistics (BLS).

The food price data used to develop the CPI-U are collected throughout the month for a wide variety of typically purchased foods. Month-to-month changes in these prices are weighted by their importance in the food budget and are reported in the form of index numbers for major product groups (e.g., meats, dairy products, cereal and bakery products). The reports are then made public with about a 1-month lag. That is, the CPI changes for October will be released in the last week of this month.

The CPI-U is a price index. A 10-percent increase in the CPI-U for food does not necessarily imply that the average consumer spends 10 percent more for food. Consumers adjust their purchases in response to higher or lower prices, but the process used to construct the CPI-U does not take such adjustments into account. The CPI-U is, therefore, best thought of as what it is—a price index and not a cost of living index.

This distinction is particularly important for food. Food prices for specific items can be quite volatile because of supply disruptions

owing to biological phenomena or natural disasters. For example, last spring lettuce prices increased to over \$1.00 per head, reflecting the reduced quantities available. Undoubtedly, many people bought less lettuce, but the CPI-U only reflected the fact that retail lettuce prices were 125 percent higher.

The relative importance of food in the CPI-U is about 18 percent, reflecting on average the proportion of consumer expenditures going for food (table 1). The "all food" index is subdivided into two major components: food at home (12.2 percent) and food away from home (5.5 percent). Of the food-at-home purchases, meats now account for 32 percent. Other important groups include fruits and vegetables (14.4 percent), dairy products (13.5 percent), and cereal and bakery products (12.5 percent). Categories of increasing importance are the non-alcoholic beverages (12.4 percent) and the processed foods (8.5 percent).

Food price determinants

The challenge in food price forecasting is to predict the value of the CPI-U index. In deriving forecasts of this index, the USDA effort centers on price determinants in three broad areas: The farm production sector; the food marketing system; and, consumer purchase conditions.

Farm commodity prices.—Even though raw farm commodities have over time become a smaller proportion of total food expenditures, conditions in the farm sector are still essential to evaluating the food price situation. On the average, the farmers' share of expenditures for domestically produced farm foods is now about 40 percent. For total food expenditures, it is much smaller (26 percent).

TABLE 1.—RELATIVE IMPORTANCE OF FOOD GROUPS IN THE CONSUMER PRICE INDEX, DECEMBER 1977

[In percent]

	Consumer Price Index	All urban
Food.....	17.718	
Food at home.....	12.235	100.00
Cereals and bakery products.....	1.530	12.51
Meats, poultry, fish, and eggs.....	3.943	32.22
Dairy products.....	1.654	13.52
Fruits and vegetables.....	1.759	14.38
Sugars and sweets.....	0.435	3.56
Fats and oils.....	0.360	2.94
Nonalcoholic beverages.....	1.513	12.36
Other prepared foods.....	1.041	8.51
Food away from home.....	5.483	

Commodity prices are largely determined by the quantities produced, both domestically and worldwide. The amount produced is, however, heavily influenced by the rather unpredictable forces of nature—weather, pest infestations, and plant and animal diseases. These occurrences are near impossible to predict; yet, they are usually the source of food price forecast errors.

Last year was an excellent example. The major contributors to the larger than anticipated food price increases were red meat and fresh vegetable prices. In both cases, weather was at least the indirect,

if not the direct, cause. Severe cold weather, for the second consecutive year, in the primary hog-producing States adversely affected the availability of pork. Early indications were for hog farrowings to be 13 percent higher in December through February than in the same period a year earlier. When the pig numbers became available, however, farrowings were actually down 1 percent. Weather-induced disease, breeding, and other problems will result in 1978 pork production being only 1 percent higher than in 1977. A 10-percent increase was originally forecast.

The weather-induced problems touched off a chain reaction in meat prices. Without the increased pork production, which had been expected to dampen the beef price increases, prices of both beef and poultry increased at a much more rapid rate than expected.

Then, following a prolonged drought, the rains came to California. Planting and harvest schedules for some vegetables, notably lettuce, were disrupted. Lettuce prices, usually in the \$2.50 to \$5 per crate range, rose to as much as \$18 (300 percent). In addition, the cold weather early in the year affected the availability of some fruits causing their prices to rise unexpectedly.

In the aggregate, the approximate 15-percent increase in all farm commodity prices this year will contribute about 40 percent of the increase in 1978 food prices.

Marketing costs.—The costs for marketing food—for transforming raw commodities and for transportation from the farm to the supermarket—are becoming increasingly important. In 1978, increased costs for domestically produced farm foods will be responsible for about one-half of the higher food costs.

The largest single component of the marketing bill is labor, accounting for 47 percent. (The fact that labor costs exceeded the farm value for the first time in 1977 was widely publicized.) By yearend, labor costs for 1978 will have increased 10 percent over the 1977 level.

Food prices are also more significantly influenced by energy-related input costs. Packaging and transportation costs which account for about 21 percent of total marketing charges importantly reflect energy prices. Packaging costs this year will have increased about 6 percent, while transportation costs will be about 10 percent higher than in 1977.

Consumer purchase conditions.—The influence of changing conditions for food demand are of varying importance to food prices from year to year. There is no doubt that rising incomes, reduced unemployment, and the increased population influenced food prices in 1978. But other, more subtle, changes are influential as well. There are more multiple income families; family sizes are smaller; social mores and the role of women (and of men) are changing. These changes alter the kinds of foods purchased and the amount of associated services demanded by consumers.

The impact of these changes is reflected to some extent in the relative weights attached to the various components of the CPI. Adoption this year of the broader-based CPI-U with the changed weights did influence 1978 food prices.

Food away from home now has a 31 percent weight—9 percent more than the previous (unrevised) index. The “other processed food” category has increased in importance by more than 50 percent.

The nonalcoholic beverage category now has a 12.3 percent weight—30 percent higher than previously.

Purchases of those foods without a domestic farm product base now account for almost 20 cents of each dollar spent on food. Purchases of foreign foods (like coffee and bananas) and fish are also becoming relatively more important.

FOOD PRICES IN REVIEW

While food price increases are headline news, it is important to view such reported increases in historical perspective. An examination of the year-to-year changes in retail food prices since 1950 reveals that, in 17 of the 27 years, food price increases contributed less than 1 percentage point to the overall rate of inflation (table 2). In four of those years (1953, 1954, 1955, and 1959), food prices actually reduced the overall rate of inflation in the economy.

The more recent history is a different story, however. Four of the largest year-to-year percentage changes in retail food prices have occurred since 1972. Only once since then (in 1976) have food price increases contributed less than 1 percentage point to the overall inflation rate.

THE FOOD PRICE OUTLOOK FOR 1979

I noted earlier that food price forecasting is a risky venture, owing primarily to the uncertainty associated with agricultural production. So, without employing extremely heroic assumptions or without constructing such wide ranges as to be meaningless, how might we approach developing a forecast for the year ahead?

An aggregate approach

One approach is to separate the major components of total food expenditures and examine each as to expected price movements. The major components of food expenditures are: the value of farm commodities, the costs for marketing services, and the costs for foods without a domestic farm product base.

While the relative proportion of each component varies from year to year, recent weights are:

The value of farm commodities—26 percent.

Costs for marketing services—57 percent.

Expenditures for “other” foods—17 percent.

The value of farm commodities can be highly volatile since production is determined by domestic and worldwide weather, policies of major trading nations, and other factors. Thus, the rate of change assumed for this category is really an assumption about production and total supplies, hence largely about the weather. Crucial to the 1979 food price situation will be developments in both poultry and pork production. As always, favorable weather will be important for abundant fruit and vegetable supplies.

TABLE 2.—CONTRIBUTION OF FOOD PRICES TO INFLATION

Year	Change in food prices (percent)	Contribution to overall inflation (percentage points)
1951	+11.1	+2.7
1952	+1.8	+4
1953	-1.5	-4
1954	-2	-1
1955	-1.4	-3
1956	+7	+2
1957	+3.3	+8
1958	+4.2	+1.0
1959	-1.6	-4
1960	+1.0	+2
1961	+1.3	+3
1962	+9	+2
1963	+1.4	+3
1964	+1.3	+3
1965	+2.2	+5
1966	+5.0	+1.2
1967	+9	+2
1968	+3.6	+9
1969	+5.1	+1.2
1970	+5.5	+1.3
1971	+3.0	+7
1972	+4.3	+1.0
1973	+14.5	+3.5
1974	+14.4	+3.5
1975	+8.5	+2.0
1976	+3.1	+8
1977	+6.3	+1.5
1978(F)	+10.0	+1.8

The marketing services component is more directly affected by price changes (inflation) in the general economy than are the other two components. While prices and costs of the various categories such as labor, packaging, transportation, and energy will individually vary, increased costs for the marketing services will at least reflect the underlying rate of inflation.

Price increases in the "other foods" category are generally determined by conditions outside the United States. These are primarily imported products and include such items as fish, coffee, bananas, and sugar. Their prices are highly volatile; since 1970, prices for these foods have risen more than 145 percent, compared to a 60-percent increase for domestically produced foods.

By making alternative assumptions about increased costs in each of these three broad areas, we can develop a range for our 1979 food price forecast (figure 1).

A conservative estimate of the increase in prices for all farm products next year is 5 percent. This would increase 1979 food prices by 1.3 percent over the 1978 level.

If the inflation rate in the general economy should subside to a 6 percent annual rate, marketing costs would contribute another 3.4 percent to food price increases.

If prices for the "other foods" category increase 8 percent, another 1.5 percentage points is added to 1979 food prices.

Thus, this might be viewed as a minimum food price increase for next year—6-percent higher than in 1978. It explicitly assumes a slowed rate of inflation, no weather adversities, and increased output of pork and broilers.

But what if we are not so fortunate? Suppose weather patterns next year repeat those of this year. And, what if the inflation rate moves to 8-percent annually? We could view this as a "worst case" to establish an outer point on our range.

Considering that we are near the low point in the cattle cycle, it is not difficult to imagine a situation where farm product prices next year advance another 15 percent. Weather conditions this winter could again thwart efforts to increase pork production. Diseases and the lack of hatching eggs could continue to affect the expected broiler output. Adverse weather could again reduce fruit and vegetable supplies. Under these generally unfavorable conditions, farm product prices could advance another 15 percent. This could contribute 4 percent to higher food prices.

Overall inflation at an 8 percent or higher annual rate could, through higher marketing costs, add another $4\frac{1}{2}$ percent.

Another 1.7 percent would be added by increased costs for foods without a domestic farm product base.

This set of circumstances would have food prices again increasing 10 percent for the year.

Having established this rather wide range—6 to 10 percent—can we be more specific about what can logically be expected from our vantage at this point in time? I think we can.

Our analysis of the world and domestic agricultural supply-demand situation suggests that prices of all farm commodities will increase 7 percent next year, adding 2 percent to an overall food price increase.

A review of the macroeconomy suggests the rate of increase in marketing costs next year will probably be about 7 percent, increasing food prices by 4 percent.

Price increases for foreign foods, fish, and nonalcoholic beverages can be expected to add 1.5 percent to the increase.

Thus, summing over these three components for this current most likely situation, we would expect retail food prices to increase about $7\frac{1}{2}$ percent next year (year over year). As is generally the case, price increases will be most evident during the first half of the year. During the third and fourth quarter, increases should moderate, and prices may even decline slightly.

Figure 1

OVERVIEW APPROACH--BOUNDARIES FOR FORECAST RANGE

		Increase in : Implied food : Increase in : Implied food					
		: price increase: component		: price increase: component		: price increase	
OTHER 1/	17%	+8%	+1.5%	+8%	+1.5%	+10%	+1.7%
	57%	+6%	+3.4%	+7%	+4.0%	+8%	+4.6%
MARKETING SERVICES							
	26%	+5%	+1.3%	+7%	+1.8%	+15%	+3.9%
FARM VALUE							
			+6.2%		+7.3%		+10.2%

A second level of detail indicates where the increased prices will be coming from (figure 2).

	1978	1979	Contribution to food price increases
<u>Other (17%)</u>		+8%	1.5%
<u>Marketing Services (57%)</u>			
Labor (27%)		+8%	
Packaging (7%)		+6%	
Transportation (3%)		+8%	
Other (20%)		+6%	4.0%
<u>Raw Farm Commodities (26%)</u>			
Livestock products (11%)		+12%	
Dairy (8%)		+8%	
Fruits and vegetables (4%)		+2%	
Crops (9%)		+5.5%	1.8%
			Total +7.3%

FIGURE 2

Macroeconomic forces influence food prices on the demand side as well as the cost side. During the past 22 months, 3.9 million additional people have become employed. The unemployment rate has declined 7 to 5.8 percent. But employment gains over the next 12 months may not keep pace with the recent gains. If the unemployment rate should again grow next year and real growth substantially slow, the attendant reduced demand pressure could move food prices from the 7½ percent closer to the 6 percent forecast.

Marketing cost increases will primarily reflect increased costs for labor and transportation. Even with the anti-inflation guidelines, another 8-percent increase in labor costs can be expected for 1979. Scheduled minimum wage increases will be an influence. However, the exemption for workers earning less than \$4 per hour is likely to be significant in the food industry. Packaging costs are expected to increase 6 percent, transportation 8 percent, and the "other services" 6 percent.

Farm product prices in each major category are now expected to be higher than 1978 levels. At this time in the year, there is little alternative to assuming favorable weather for 1979 and the corresponding implied crop production levels. Thus, even though prices for all commodities are expected to increase 7 percent next year (about half the increase of 1978), this is due primarily to livestock and not crops. Grain prices are expected to remain stable, exhibiting perhaps only slight increases, and this for feed grains.

The largest expected price increase for any commodity group is for livestock. Meat animals prices are expected to increase about 13 percent, reflecting the higher cattle prices. Expansion in poultry production will result in stable to slightly declining prices in the poultry and eggs category. Dairy product prices will again increase about 8 percent, similar to 1978.

The forecast summarized

We have considered in detail the world supply and demand conditions for all agricultural commodities, the general economic situation, and the input markets most important to the food sector in developing our forecasts. The result of that total effort is summarized in index numbers corresponding to the categories of the CPI-U. These indexes, by quarter, are shown in table 3. The highlights of the forecast are:

Retail meat prices will again contribute significantly to higher food prices. We expect retail prices for beef and veal for all of 1979 to average 11.5 percent higher than in 1978. All red meats will be about 8.3 percent higher. The most noticeable increases will come in the first two quarters of the year.

Processed fruits and vegetables will also increase at a double-digit inflation rate. While prices at the farm level are expected to be just slightly higher, marketing cost increases will be primarily responsible for much larger price increases.

Prices for dairy products, sugar and sweeteners, cereal and bakery products, and fats and oils are expected to increase at about 7 percent for the year.

I have indicated throughout these remarks the rather tenuous nature of the food price forecasting exercise. We cannot be certain about either crop or animal product production. To add to the uncertainty, we are

faced this year with an atypical marketing cost situation. A great deal depends on the success of the President's anti-inflation program.

TABLE 3.—CONSUMER PRICE INDEXES FOR FOOD (CPI-U)

[Percent change from year earlier—NSA]

Component	1978		1979				1979/78
	III	IV	I	II	III	IV	
Beef and veal.....	28.8	26.0	20.0	9.4	8.8	9.1	11.5
Pork.....	9.2	10.2	6.7	2.4	3.5	1.9	3.6
Other meats.....	19.8	19.2	14.0	6.1	6.0	5.1	7.6
Red meats.....	20.5	19.5	14.5	6.6	6.7	6.2	8.3
Poultry.....	12.3	11.8	9.3	2.9	-1.5	-4.0	1.5
Fish.....	8.2	7.3	6.9	6.0	-7.3	8.9	7.3
Meat, poultry and fish.....	18.3	17.3	13.1	6.1	5.8	5.3	7.5
Eggs.....	-4.8	13.5	5.9	5.7	5.4	2.9	4.9
Dairy products.....	6.7	9.3	8.6	7.2	6.3	4.4	6.6
Fats and oils.....	7.3	10.4	11.8	9.0	7.0	6.9	8.6
Fresh vegetables.....	17.3	12.7	8.2	-4.3	-7	5.8	2.0
Processed vegetables.....	28.5	18.7	10.1	11.9	12.8	11.1	11.5
Fresh fruit.....	16.3	10.9	5.2	1.0	0	5.2	10.5
Processed fruits.....	10.2	12.2	10.5	11.6	12.1	8.0	11.0
Processed fruits and vegetables.....	16.4	14.0	11.3	5.4	5.7	9.6	7.0
Fruits and vegetables.....	12.4	12.7	9.2	7.1	6.7	6.1	7.2
Sugar and sweeteners.....	10.4	11.1	9.9	8.9	7.5	6.2	8.1
Cereal and bakery products.....	-1.7	1.7	2.2	2.3	3.6	3.5	2.9
Nonalcoholic beverages.....	9.7	9.1	9.1	9.0	8.0	7.7	8.4
Other foods.....	11.2	11.9	9.8	6.4	6.1	5.4	6.9
Food at home.....	9.3	10.5	9.4	8.4	7.8	7.0	8.1
Food away from home.....	10.5	11.4	9.7	7.0	6.6	5.9	7.3
All food.....							

At this point in time, we believe that food prices in 1979 will be at least 6 percent higher than in 1978. Poor weather conditions and lower than expected pork and poultry output could push prices as much as 10 percent higher. Our "most likely" estimate is that food prices for the year will average 7½ percent higher than in 1978.

There is an old adage that "if you can't forecast well, forecast often." Food prices, as we have seen in 1978, are not easy to forecast with a great deal of accuracy. Unexpected events will no doubt alter the outlook I have just presented. It will, of course, be revised over the year to reflect the changing conditions. I invite you to watch for our unscheduled press releases that may be prompted by events and for our monthly analyses published in "Agricultural Outlook."

EVALUATION RESEARCH PRIORITIES FOR FEDERAL NUTRITION PROGRAMS

(By James E. Austin, Associate Professor in General Management, Harvard Business School)

Federally funded nutrition programs have expanded dramatically over the past decade. In fiscal year 1969 the budget was \$1.2 million; by 1979 it had jumped to \$9.5 billion (see table 1). As a percentage of USDA's total budget it soared from 14 percent to 49 percent over this 10-year period. Those figures alone make it vividly clear that USDA is heavily into the consumer nutrition business and, in fact, that area has been its primary growth activity in resource terms. Today, consumers are as much the Department's constituency as farmers.

Although the breadth and magnitude of the Agency's nutrition programs have expanded tremendously, evaluation of these efforts has not. Evaluation has seriously lagged behind program growth. The absence of systematic and thorough program evaluation leaves policymaking on tenuous grounds: We do not know how well we are doing nor whether we could be doing it in better ways. Thus, evaluation is needed to measure goal attainment—that is, the impact of resource allocation—and to identify more cost-effective ways of achieving the policy goals.

Fortunately, both Congress and USDA have recently recognized the critical importance of program evaluation and have designated it as a priority activity. For example, Congress has specifically authorized up to \$14 million for evaluation of the food stamp program and up to \$3 million for assessing the WIC program. In total there would be as much as \$17 million per year for the next 3 years for evaluation research on these nutrition programs administered by the Food and Nutrition Service (FNS) of USDA. These funds represent a modest resource allocation when compared to the total fiscal year 1979 \$9.5 billion budget for nutrition programs. Nonetheless, the allocation is orders of magnitude above the amounts budgeted for evaluation research in previous years; for example, \$1 million in 1976. We are in the rare and desirable position today of not facing funds scarcity as the major constraint to effecting meaningful evaluation research.

In addition to increasing the evaluation research budget, the Department recognized the importance of this activity through organizational changes. In 1978 the Office of Policy, Planning, and Evaluation was established within FNS. This entity has the responsibility for ensuring that the legislatively mandated program evaluations are carried out as well as additional studies deemed necessary to enhance the efficiency and effectiveness of the nutrition programs. This organizational move was very significant. Shifting one's strategy generally required changes in structure to ensure effective implementation. By creating a new subentity with explicit responsibility and

authority, the Department has significantly enhanced the prospects of successfully carrying out the evaluative function. Speaking from my own point of view, and not as a Department representative, I would like to comment on what may lie ahead as these changes begin to take effect.

One might contend that focusing on evaluation research is too narrow a topic for an outlook conference. However, such concern is really unfounded, because evaluation research is an integral part of the larger policy and program development process. Thus, by focusing on key evaluation research priorities, we will also be highlighting important policy and programmatic issues facing the FNS nutrition programs as we move into the 1980's. Before pinpointing these priorities, it might be useful to present a basic framework for looking at evaluation research.

FRAMEWORK FOR NUTRITION PROGRAM EVALUATION RESEARCH

The first step in formulating nutrition program evaluation research is to specify the users and their data needs. Failure to do this can lead to irrelevant, excessive, or insufficient evaluation information with the resultant inefficiency and ineffectiveness. Evaluation research is not an academic exercise; it is an input to decisionmaking. The primary types of users of nutrition program evaluations are legislators (Federal and State), Federal program administrators and regulators (FNS, HEW Administration on Aging), State agencies, local program managers, and program beneficiaries. Clearly, the types, forms, and frequency of information needed could vary considerably. From the Federal perspective there may be a logical tendency to focus efforts on the upward flow of information and to neglect the distinctive and more operational information needs of local or State administrators. Similarly, local projects may be collecting information for their own purposes that could be of utility to State or Federal decisionmakers, yet is not part of the required reporting system. Much existing information is underutilized from an evaluation standpoint. Systematic documentation and coordination of user needs and data collection systems is highly desirable for more effective nutrition programing in this country.

In addition to user designation, an evaluation framework can also take a programmatic focus. In this context it is useful to distinguish between three program research categories:

(1) *Monitoring of ongoing programs.*—This involves the collection and analysis of standard, overall, program performance data and should be an integral part of all national programs. The data generated can provide feedback to Federal policymakers as to the extent to which program goals are being attained; information from such a system can also serve as a managerial control system program for administrators at the State and local levels.

(2) *Analysis of program adjustments.*—Here one is testing the impact of a modification in some particular aspect of an overall program; for example, the elimination of the purchase requirement for food stamps. This type of research should be based on a clearly stated hypothesis as to the expected effects. Only those program adjustments hypothesized to have a significant effect on costs or nutritional impact should be evaluated.

(3) *Assessment of new programs.*—This evaluation research occurs seldom and has distinctive research problems. For example, startup problems impede meaningful evaluation. One should postpone impact evaluation until the inevitable operating difficulties in mounting a new delivery system have been worked out. In this way, one is testing true program potential. Some of the problems in the early efforts to evaluate the WIC program can be traced to this problem of premature evaluation. Pilot projects which are expandable to a larger scale are generally desirable first steps in the planning and evaluation process.

Each of these three types of program research could be evaluated along several dimensions; however, the following seem particularly relevant to program policy, planning, and operation:

(1) *Nutritional impact.*—All of the Federal food and nutrition programs have stated nutrition goals. These often lack specificity, but to the extent that nutritional improvement is being put forth as a rationale for the program, we should ascertain to what extent the goals are being attained. Impact can be measured in terms of immediate biological effects—for example, birth weights, growth status—and, in some instances, these can and should be translated into the resultant benefits; for example savings in hospitalization costs, or enhanced work performance.

(2) *Impact determinants.*—Although knowing whether a program achieved a nutritional impact is important for policymakers, it is insufficient. What is perhaps the even more relevant question from the program planning perspective is why a program did or did not achieve the expected results. This implies the need to examine key factors which influence impact; for example, participation rates, target group coverage, food quality, food expenditure behavior.

(3) *Costs.*—The scarcity of resources makes it essential that program evaluation encompass the economic dimensions and relate costs to impact. Cost-effectiveness or cost-benefit indicators are helpful in measuring the optimality of resource allocation. Evaluation here can also focus on program efficiency; that is, means of achieving cost savings without decreasing impact or increasing impact without increasing costs.

There is another aspect of program research that merits a comment; namely, methodology. Because evaluation has been relatively neglected, we frequently find ourselves in the position of not knowing how to do it. Evaluation survey techniques, impact measurement instruments, performance standards all present technical and scientific problems that must be addressed. Thus, there is a need to invest in the development of better nutrition program evaluation methodologies in order to increase the meaningfulness of the data we collect and analyze. This is not to say that useful program evaluation cannot be carried out now. But it is important to recognize that resources must also be simultaneously allocated toward strengthening our research capability.

One final comment on the general approach to evaluation research concerns the "minimum information rule." Evaluation efforts should collect as little information as possible to carry out the research task at hand. Evaluation exercises have no intrinsic value; their utility only comes from the role they play in assisting decisionmaking.

Thus, simplicity and application should be the guidelines in designing the research. This returns us to the initial element of our framework: the users. Designating clearly who they are and specifying their informational needs for decisionmaking will greatly enhance the utility of the evaluation research efforts.

Having presented a basic framework for evaluation research of nutrition programs, we can now turn to the specific evaluation research priorities for these programs.

RESEARCH PRIORITIES

We shall examine research issues in each of the three major FNS administered nutrition programs: food stamp, school feeding, and WIC. It should be noted that focusing on individual programs is not a surrogate for formulating overall national food and nutrition policy. Rather, examining the programmatic pieces should serve as an input to the broader policy process.

Our look into program research needs will not present an exhaustive shopping list or a detailed profile of specific research projects. Rather, it will attempt to highlight the types of evaluation research needed in order to address key policy and program design issues facing the programs. No evaluation research agenda is definitive. User needs continually change and results reveal additional paths warranting examination. This dynamic characteristic means that flexibility is key to managing an effective evaluation research program.

Food stamp program (FSP)

At \$5.8 billion this is the largest program and it also faces perhaps the most fundamental policy issue, namely, should it continue as is or be converted to an income transfer program. This option of "cashing out" FSP has resurfaced on the policy agenda several times, in various forms, over the past years, generally as part of welfare legislation reform proposals. Congress has expressed serious interest in moving in this direction and evaluation research is very relevant to those deliberations.

The key research question is whether or not the nutritional impact would be reduced if FSP were cashed out. Our ability to answer that question is severely limited due to the absence of data on low income consumers' expenditure behavior. For evaluation one has to ascertain where in the calculus of nutritional intake are the program adjustments having their impact: price? income? preferences? food availability? For the cash-out issue the key variables are income elasticities and marginal propensities to consume foods. We need to know how food patterns would change without food stamps but with an equivalent income supplement, and what the nutritional significance of any resulting differences are.

An analysis of food and nonfood expenditure data at various low-income levels for FSP participants and nonparticipants would give us a partial picture of the possible impact. A pilot longitudinal study which documented the expenditure changes of a group of FSP participants who shifted over to direct income supplements would give an even closer picture of the possible behavior change.

Nutritional impact can be examined in terms of nutrient changes between groups or programs and relative to RDA's. It can also be looked at relative to nutritionally desirable consumption patterns such as some version of those recommended in the National Dietary Goals promulgated by the former Senate Select Committee on Nutrition and Human Needs. How to use RDA's and National Dietary Goals as impact measurement tools represents an important methodological research need.

The cash-out decision, however, must not just examine the nutritional impact side. It should also examine the cost and institutional implications. The possible cost savings of shifting from the existing to the new system must be estimated and tested on a pilot basis. The analysis should also examine the probable impact on the existing institutions involved in the food coupon distribution and redemption and on the new system's institutions. Of particular concern should be the possible effects of the shift on program participation.

Whether or not one cashes out FSP there remains another related program design issue which is the level of the income subsidy. Under current FSP procedures this is basically based on the amount of expenditure needed to acquire adequate nutrition. The reference point is the thrifty food plan model diet. It is doubtful that any family's diet actually coincides with the TFP. The FSP income is incorporated into their total income from whence emerges their food expenditure pattern. It would be useful to know to what extent actual diet patterns vary from the TFP, how, why, and the nutritional significance of the variations. This is a partial check on the utility of the TFP as a reference tool. A related and even more important policy issue, however, is how big the income supplement or TFP budget should be. More specifically, what would be the nutritional significance of altering that level upward or downward by, say \$10. It is clear that food stamps or income supplements have a positive effect on food consumption. What we do not know is the extent of the nutritional impact for changes at the margin. Such changes carry multimillion-dollar fiscal implications, and thus their nutritional effects should be evaluated.

A fundamental complicating fact in interpreting any of these nutritional impact data is our relative ignorance concerning the functional significance of various dietary deficiencies. For example, it is not clear how a 5-, 10-, or 15-percent protein shortfall or calorie excess will affect such activities as physical output, mental performance, and health status. These unknowns require more basic research on the functional significance of nutritional status. In the interim, policymakers must interpret nutritional impact differences through imperfect glasses.

A final program adjustment that merits evaluation is the forthcoming elimination of the purchase requirement. The basic rationale for this adjustment was to remove an economic barrier to program participation. Consequently, this hypothesis should be tested by measuring the changes in the numbers and type of participants. Possible administrative cost savings should also be examined. If one also had the consumer behavior data discussed above, it would also be possible to assess the nutritional significance of the EPR adjustment. Even without this, however, if one does not see positive changes in the program participation profile, then it would direct efforts toward seeking and examining other possible participation barriers. Focusing

on such an impact determinant is very relevant for FSP because actual participants constitute only about half of the eligible population.

School feeding programs

The major school feeding intervention is the national school lunch program (\$2.3 billion in fiscal year 1979) with the school breakfast program now at the \$231 million level. The NSLP has not been systematically evaluated despite its long history. This program also faces a fundamental issue regarding its validity as a mechanism for improving the nutritional status of children.

One line of reasoning underlying this concern might go as follows: Schoolchildren are less nutritionally at risk than preschoolers of pregnant women whose nutritional requirements are greatly heightened. One would not expect a school lunch program to produce as significant changes in the growth status as might occur with the faster growing preschoolers. Furthermore, it is doubtful that the lunch provides a significant incremental intake of nutrients over what would have been consumed by the child without that program. The validity of the foregoing assertions needs verification. Studies involving anthropometric assessments can get at the growth argument. Dietary surveys encompassing home as well as school intake of program participants and nonparticipants could measure the extent of substitution and incremental intake.

There is a related issue that could be explored simultaneously; namely, the relative nutritional benefits of school breakfast versus lunch. It could be hypothesized that breakfasts would make a greater nutritional contribution because of lower substitution. Existing studies of breakfast patterns suggest that Americans frequently consume inadequate amounts due to lifestyles and food preferences. This is less likely to hold for lunches. This research could thus produce information relevant to decisions regarding the timing of the school feeding. A third alternative would be to examine the nutritional contribution of a midmorning snack. Here, one might be able to avoid almost entirely the substitution effect.

It might be very difficult to demonstrate nutritional improvement in anthropometric terms for any of the feeding alternatives. However, another justification sometimes put forth for school lunch programs is the positive effect on classroom performance . . . attentiveness, retention, et cetera. This is a very important but technically very difficult research area. It clearly merits resources, but methodological development will likely have to be a part of this. Again, the three timing alternatives should be compared in terms of their relative impact on the classroom performance measures.

Even if these evaluations revealed few explicit nutritional benefits, the program could still be justified as an income transfer or as a service for the convenience of parents or as market support for farmers. Then nutritional evaluation of the program would have to follow the "do-no-harm rule." In other words, were the meals' contribution to the children's total dietary intake causing adverse patterns (for example, relative to the national dietary goals) or beliefs? However, I believe that there is another more positive nutrition avenue to explore. If one reconceptualized school feeding as an educational vehicle, then exciting possibilities arise for potential longer run benefits through

nutrition education. Food habits and beliefs are shaped to a great extent by what we eat and what we learn about foods. Currently school feeding activities are generally viewed by teachers and administrators as an administrative appendage, if not a burden, to the educational activities of the school. These attitudes could be shifted if the primary goal of the school-feeding programs was to increase the students' nutritional knowledge and to enrich their learning environment. The pedagogical attractiveness of food and feeding is that they can be used to help teach almost any subject matter from math to history to science. The opportunities for very exciting curriculum development abound.

The importance of nutrition education has been increasingly recognized by Congress and USDA. For fiscal year 1978 as well as fiscal year 1979 \$26 million have been allocated for innovative nutrition education projects within the child-feeding programs. Bold imagination is called for rather than simple tinkering. But regardless of the form of these projects, all will face difficulties in evaluating their efforts. There have been very few systematic and thorough evaluative efforts of past nutrition education programs and so we are left without clear methodological procedures. Thus, the research must develop and test methodologies which will enable funders and project directors to assess the nutritional significance and identify critical determinants of effectiveness.

WIC

The special supplemental food program for women, infants, and children has expanded tenfold since 1972 to its current budget of \$550 million. Sizable program expansion is also projected for the future and so evaluative information regarding program impact and design is particularly pertinent.

Some impact studies have been conducted and reveal positive benefits from the prenatal supplementation in terms of increased birth weights and lowered incidence of low birth weight infants. This impact has very significant economic implications. Lower birth weight babies have higher hospitalization rates as well as a greater incidence of subsequent handicaps. Reducing these costs appears to make prenatal supplementation potentially very cost-effective; that is, the preventive approach is preferable to the curative one. The impact data and benefits for infant and child feeding is less clear. In both instances further evaluation is desirable to document effects. Fortunately, such studies can be carried out by analyzing existing retrospective data on WIC participants. Non-WIC participants for whom data also exists in the clinics can be used as control groups.

A program adjustment issue related to the impact evaluation concerns participant eligibility for both the women and the children. Not all prenatally supplemented mothers show any demonstrable impact from the supplement. This could suggest that perhaps the "at risk" criteria for admission to the program were not serving as an effective screen. People who were not in need of the program were receiving it. Similarly, some observers have argued that the eligibility age for preschoolers should be reduced from 5 to about 3 years, on the grounds that it is the younger group which is more nutritionally vulnerable. What is at issue is how sharply you target your program

with the goal being to improve nutritional impact. Resources not spent on those who do not need or are not benefiting from the program can be available to increase the coverage of needier groups. We need further research which will develop and test more refined "at risk indicators" and we need to document the nutritional impact along the at-risk spectrum and along the time spectrum for children.

The eligibility for child supplementation deserves a special comment. At-risk pregnant or lactating women have a finite time during which they can participate in the program. Children, however, are recertified every 6 months and thus can get knocked off a program if they are no longer at risk. For example, their growth levels or hemoglobin levels may reach acceptable levels. Removal from the program, however, might simply reexpose the child to the deprived nutritional environment and result in subsequent relapse. The policy issue is how long to keep a child on a program and documentation of relapse rates would be very relevant to this issue.

Assessing impact is not enough. We should also examine the determinants, particularly those factors affecting participation. Prenatal participation appears to vary greatly among programs and participants. An examination of the underlying reasons would be useful. In this regard outreach mechanisms and effects of alternative delivery system modes warrant scrutiny. More specifically, the alternative delivery systems—home delivery versus commercial stores—merit analysis regarding relative costs, target group coverage, food offering, and coupon redemption rates. It would also be useful to designing the size and composition of the WIC food package to document the extent to which the WIC supplemental food package is shared among family members, thereby reducing the amount available to the target group individuals. As with the school lunch program, it would also be relevant to ascertain the extent to which the supplement simply substitutes (in quality and quantity terms) the normal intake of the participants.

Another delivery system issue is the extent to which WIC should be tied into a health care clinic system. Conventional wisdom is that the presence of WIC attracts at-risk mothers to the clinic. This "magnet theory" needs to be empirically tested by examining WIC and non-WIC health services utilization rates. The supposed synergies may not exist.

Another area deserving analysis is the food package. There is some evidence that food preferences are not always met by the limited product offering. Nutritional impact can be adversely affected; for example, the nonfortified cereals do not appear to be a favored product and are sometimes left unconsumed. However, this raises the broader issue of the nutrient profile of the WIC package. It should be evaluated in the context of its contribution to the total diet. For pregnant women this also frequently includes consumption of multivitamin and iron pills. It may well be that through these sources the body's maximum absorption limit has been reached, thus preventing any further impact from the WIC supplement. Verification of such possibilities is needed. There is even a more fundamental issue which is the functional significance of marginal anemia. Again, we face a knowledge gap requiring more basic research.

In WIC, like the school programs, nutrition education is receiving more attention. Problems of overnutrition are particularly appropriate for the educational intervention. However, the need for systematic evaluation of the impact of nutritional counseling and the design of innovative approaches are needed.

The final policy area relevant to WIC evaluation is the same as the first one we posed for the food stamp program; namely, cashing it out. The nutritional and cost implications of such an option deserve analysis, and the methodology would be similar to that for the FSP analysis, but with special attention given to the expenditure on and intake of foods for the WIC target group.

Special groups

One last area meriting further research is an analysis of the nutritional needs of special target groups. These include Native Americans, migrants, elderly, and rural poor. For the various existing programs to be effective in meeting these groups' needs, it may be necessary to make significant program adjustments. To do that requires the information from additional research.

CONCLUDING NOTE

The main Federal nutrition programs have all moved out of the startup stage. Some will still experience significant growth while others require consolidation and modification. New efforts also loom on the horizon. The policy and programing issues and decisions inherent in managing these programs need to be based on reliable and timely data. Evaluation research is the vehicle for producing the necessary information base. If adequately funded and efficiently managed, the evaluation research will be an investment that will pay for itself several times over.

TABLE 1

[Dollar amounts in millions]

	Fiscal year	
	1969	1979
Food stamp program.....	280	5,771
Food donations to needy families.....	282	13
Child nutrition programs.....	545	2,903
Special milk program.....	104	142
Special supplemental food programs.....	(1)	570
Other ²	17	104
Total.....	1,228	9,502

¹ Included with food donations to families.

² Includes administration and cost of some commodities.

Note: Figures may not add due to rounding.

U.S. FARM AND FOOD POLICY: WORLD VIEW

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ECONOMIC OUTLOOK

(By Courtenay Slater, Chief Economist for the Department of Commerce)

Good morning. I am pleased to be here to participate in the National Food and Agricultural Outlook Conference. In the last few years, the importance of the agricultural sector in the overall economic outlook has been repeatedly—and at times dramatically—demonstrated. So I will be following the discussions at this Conference with great interest. In my remarks, however, I will stay away from agriculture and attempt to survey the other major aspects of our economic situation and prospects.

Several recent policy actions will have important effects on next year's economic performance: A major tax reduction has just been signed into law, a comprehensive anti-inflation program has been adopted, and a set of monetary and financial moves designed to strengthen the international position of the dollar has been undertaken.

These moves have led to a great flurry of reassessments of next year's outlook. Some of these assessments have been highly pessimistic—I believe unduly so. Thus I would like to begin this morning by attempting to put recent developments into perspective. Despite our undeniably serious inflationary problem, the economy is just finishing up a year of well-balanced real growth. Employment has grown rapidly and unemployment has been reduced. The most recent data indicate that the pace of economic growth is being sustained in the fourth quarter.

Somewhat slower growth is to be expected next year, but there are sufficient sources of strength and there is sufficiently good balance among the major economic sectors that it is difficult to envisage an abrupt or dramatic slowing of economic activity. Thus 1979 may be looked to as a year in which growth will moderate, perhaps bringing with it some rise in unemployment, but a year in which progress will be made in narrowing our foreign trade deficit and reducing the rate of price increase.

Let me back up and review 1978 in a little more detail. During the first 9 months of this year real output grew at an annual rate of nearly 4 percent. Employment grew by nearly 2½ million persons and the unemployment rate declined by two-thirds of a percentage point, from 6.6 percent in the fourth quarter of last year to 6 percent in the third quarter of this year, and 5.8 percent in October. Nearly 59 percent of the adult population, a record proportion, now hold jobs.

The pattern of recent economic growth has been well balanced. Home construction has continued at very high levels and business construction has begun to pick up. Exports have been growing rapidly and import growth has moderated, so that the merchandise trade deficit in the third quarter was roughly one-third less than the very large first quarter deficit. Consumer spending has held up well, and inventories

have been held carefully in line with sales performance. Plant capacity utilization has been rising, but remains well below the range which might threaten to create shortages or bottlenecks.

In short, the economy is basically healthy, and the country is more prosperous today than it was a year ago, and inestimably more so than at the bottom of the recession, when unemployment rates reached 9 percent and the inflation rate topped 12 percent. There is every reason to expect economic health and prosperity to be sustained next year.

Let me briefly review the prospects for the major economic sectors. Consumer purchases should continue to rise at moderate rates, although well below the 5 percent annual rate of gain during the first 2 years of economic recovery. Concern has been expressed that the consumer is overextended financially—that the level of debt repayments relative to income is so high that consumers must retrench. I would agree that, if the economy needed a superstrong consumer sector to serve as its driving force, or leading sector, then some concern over prospects for economic growth would be well justified. But, in contrast to earlier stages of the recovery, there are other sectors ready to take the lead.

Furthermore, the consumer is in better shape than may at first appear. Though debt obligations are high relative to income, the consumer has been able to meet payments promptly. Delinquency rates on consumer loans are no higher now than in 1976. The high debt repayment to income ratio probably in part reflects the greater use of credit by a younger and rapidly expanding labor force. Next year, continued gains in employment and earnings will provide support to the consumer sector, and the personal tax reduction which takes effect in January will allow a somewhat larger share of earnings to remain in the consumer's hands.

Residential construction activity is expected to decline somewhat during the next year, due to the tightening of financial markets that has occurred during the past year. The real story here though is that the downturn in home building has held off as long as it has and that, despite the recent further increase in short-term interest rates, this downturn still is expected to be of only moderate proportions. There is a lot of underlying strength in the housing market. Vacancy rates for multifamily dwellings are quite low by historical standards, the inventory of unsold new homes is moderate, and the number of persons in the 25 to 34 home-buying age bracket is expected to continue to rise rapidly during the next couple of years. Home ownership is recognized as a good investment. Young families are willing to work hard and to incur heavy initial obligations to make this investment. This adds up to a continuing strong demand for housing, which, if financial conditions permit, will be met by a continued high rate of construction activity.

Business investment spending may be expected to add strength to the economy. New orders for capital goods have been rising strongly. Contracts for commercial and industrial construction are presently running 22 percent above year-earlier levels, in real volume terms.

Business inventories are not high relative to sales; if anything, they are a little low. The typical first stage of a recession is an unintended buildup of inventories when sales drop below expectations. This was the pattern which precipitated the sudden drop in economic activity

at the end of 1974. Throughout the recovery period from that 1974 experience, inventories have been carefully controlled. There is no excess to be worked off. This is an important reason why I said earlier that it is difficult to envisage any abrupt slowing of economic activity.

The foreign trade balance is expected to improve in 1979. While the trade deficit will not be eliminated quickly, significant progress will be made. This change will stem from the more moderate economic growth in the United States, which will slow our growth of imports, as well as the decline in the value of the dollar against other major currencies, which will work to boost the level of U.S. exports and to shift some demand within the United States from imports to domestic production. The improvement already is apparent in recent monthly trade statistics. Exports of manufactured goods rose 30 percent from the fourth quarter of last year through this September, and trade in manufactures was nearly in balance in August and September, following a substantial deficit in the first half of the year. The improving trade picture will provide an important boost to domestic production and employment.

Summing up, economic growth can be expected to continue throughout 1979, although probably at a rate slightly below the potential growth of the economy. The expected growth rate for next year is not sufficient to guarantee any further reduction in the rate of unemployment. The unemployment rate is currently just under 6 percent. Depending on the exact pace of labor force growth and productivity change, next year's expected output growth could bring with it anything from a small drop to a moderate increase in the rate of unemployment.

I would like to turn now to the most critical of the problems which must be successfully addressed if the relatively sanguine forecast I have presented is to come to pass. During the first 9 months of this year inflation proceeded at an annual rate of over 8 percent. An inflation rate this high is a serious economic problem, and one which, as I am sure you realize, policymakers are taking very seriously. There are no quick, easy, or simple solutions. But important actions are being taken and we expect some progress to be made in reducing inflation.

First, a few words about the causes of our persistent inflation. Part of it is a food price problem, but I have promised you I won't talk about that, since you will be hearing other, far more knowledgeable speakers on that subject. The drop in the foreign exchange value of the dollar is another source of inflationary pressure. Not only have import prices been rising, but higher import prices allow scope for increases in prices of competing domestic products, like autos, TV sets, and steel.

Even more basic than either of these factors, however, is the rate of increase in production costs in the nonfarm domestic economy. Gains in labor productivity are a crucial factor in holding down the rate of increase in unit labor costs. However, the large growth in employment relative to output this year has meant only minimal gains in productivity. Despite improved productivity performance in the third quarter, gains from the year-earlier period were less than 1 percent, and unit labor costs were 8½ percent above year-earlier levels.

Thus the inflationary pressures in our economy are widespread, and a broad set of policies is necessary to deal with them. Both the Government and the private sector must be involved. Let me speak first of the steps the Government is taking.

The suggestion which most often is made to me concerning what the Government should do to control inflation is "cut spending"; "balance the budget." In fact, rather dramatic steps in this direction already are occurring.

There seems to be an impression in some quarters that only the Federal Reserve is moving with any resolve to deal with inflation. It is true that the Federal Reserve has raised interest rates very sharply during the past year in an effort to "lean against" the higher rate of inflation. But fiscal policy also has been moving toward greater restraint on the economy. The original tax cut proposal in the January budget called for a \$25 billion reduction in calendar 1979. This has now been reduced to about \$19 billion. Federal budget outlays during fiscal 1978 were \$451 billion, falling \$12½ billion below estimates released in January. Estimates of the fiscal 1979 deficit have been reduced by one-third, from \$60.5 billion estimated last January to less than \$40 billion as presently estimated. The 1980 budget is being designed to exercise continuing spending restraint and to reduce outlays as a percent of GNP.

Another helpful way of examining the economic impact of Government is to look at the combined Federal, State, and local budget. Viewed this way, the combined Government budget has been very nearly in balance during the past 6 months, with a Federal deficit which was much lower than in the previous 6 months and which was just about offset by a surplus at the State and local level.

Moving on from the budget to other aspects of anti-inflation policy, a second—and very vital—part of the Government's effort to reduce inflation deals with Government regulations imposed on the private sector. The President has directed that a Regulatory Council be established to review new and existing regulations issued by the executive branch to be sure that their economic consequences have been carefully examined. This process is intended to force the regulatory agencies—the Occupational Safety and Health Administration (OSHA), the Environmental Protection Agency (EPA), the Federal Drug Administration (FDA), and all others—to examine alternatives more fully and to choose the least costly approach to meeting a regulatory objective.

In addition the Regulatory Council will work to reduce economic regulations. The lower fares and greater service choices now available to those traveling by air illustrate what can happen when regulators seek to encourage rather than hinder competition. Similar changes in attitude and practice are needed in other regulated industries, such as trucking. It will take time before the results of these aspects of the program can have a measurable impact on the inflation rate, but the long-term results can be of great importance.

For the private sector the President has established wage and price standards, and has indicated various measures the Government could take if the standards are breeched. Annual increases in wages and private fringe benefits are to be no more than 7 percent annually.

There are, of course, some exemptions such as those for workers earning less than \$4 per hour or for cases in which higher wages are offset by changes in work rules designed to produce demonstrable increases in productivity. Every effort will be made to insure that people are treated equitably. However, success of the program requires that there be few exceptions.

Business firms are expected, in general to keep price increases in the coming year to one-half percent below their average increase during 1976-77.

The President is prepared to take action to encourage compliance with these standards. Existing restrictions on imports may be modified if domestically competing firms do not exhibit price and wage behavior consistent with the guidelines. In addition, firms either selling to the Government or selling to export markets with Eximbank assistance will be required to certify that they are within the guidelines. These steps are needed to insure that compliance with the program is widespread. General compliance will lead to a lower overall inflation rate without causing inequities among groups or individuals.

Many of you in this audience are Federal employees, and thus need no reminder that limitations have been imposed on your own pay increases as part of the anti-inflation effort. Equity will best be served if similar restraint can be achieved in the private sector.

Perhaps even more compelling than equity—as important as that is—is the stark recognition that the continued health of our economy—and to some extent of the world economy—will be influenced by the success of this program. With a reasonably successful program, the inflation rate can be held to 6½ percent or less next year. Without such success, forces could well be set in motion which would produce a serious recession next year or in 1980.

I hope I have managed to convey the importance of making this program succeed. Public support is the key to that success. All of us have a role to play in building that support. Thank you for the opportunity to discuss this vital policy issue with you this morning.

WORLD AND U.S. AGRICULTURAL OUTLOOK

(By J. Dawson Ahalt, Acting Chairman, World Food and Agricultural Outlook and Situation Board, USDA)

OVERVIEW

Global markets for food and fiber continue to expand. Rising trade of agricultural commodities is one of the key forces that are bringing nations together in an interdependent world. Although economic, social, and political objectives vary widely from nation to nation, and contribute to instability in commodity markets, mankind's efforts to upgrade diets are universal.

The global food and agricultural system today is complex and changing. Farmers, consumers, businessmen, and policyworkers need up-to-date information on commodity supplies, markets, and prices. The U.S. Department of Agriculture has long provided a wide variety of outlook information to the public. The Food and Agricultural Outlook Conference is one of our efforts to bring relevant information on the changing issues in food and agriculture to the public arena for discussion.

Brighter outlook than last year's

The current world and U.S. agricultural situation and outlook is much brighter than a year ago at this time. For the 1978-79 marketing year, crops have generally been good, with record grain supplies dominating the scene. Fortunately, demand conditions have also been favorable, particularly for U.S. farm products.

Export movement of U.S. farm commodities has been at a heavy pace this summer and fall, and the prospects for another year of record exports are good. Economic growth abroad is expected to be stronger next year, and increasing livestock numbers in the major markets are boosting the demand for grains and other feedstuffs. But the United States will encounter increasing competition from Southern Hemisphere nations for world grain and soybean markets.

In contrast to abundant grain supplies, most world livestock markets are tight—reduced cattle herds have curtailed market supplies of beef. Expanding supplies of pork and particularly poultry are helping maintain market supplies of meat in the United States, but at higher prices.

Inflation is probably the major problem plaguing the United States and much of the rest of the Western World. The dollar has been under intense pressure in 1978. Recently, the President has taken strong steps to contain inflation through: (1) Tighter fiscal and monetary policies, including steps to bolster the dollar; (2) appraisals of regulatory and other governmental policies that contribute to inflation; and (3) imposition of voluntary wage and price standards. These combined actions will substantially affect economic developments and the prospects for food and agriculture in 1979.

I would like to outline the prospects for global economic growth and world agricultural supply and demand in the coming year, and discuss the probable impact of those conditions on U.S. farm prices, farm income, and retail food prices.

WORLD ECONOMIC CONDITIONS

A glance at the world economic outlook for the coming year will give us some idea of the prospects for world demand for agricultural products, and for prices and incomes in the United States and abroad.

We foresee slightly more rapid growth rates in 1979 than this year for the developed countries. About the same rate of expansion as last year is forecast for the developing world with the East Asian nations continuing to show the largest gains. Growth rates should be increasing in major markets including the European Community, Eastern Europe, Japan, Taiwan, and the Republic of Korea. Improvements in economic activity imply continued expansion in personal incomes and in world consumption and trade of agricultural products.

Domestically, we can expect to see some dropoff from 1978's economic growth rate of around 4.5 percent because of the President's anti-inflation program. A positive response to the President's various anti-inflation efforts may slow economic growth to about 2 to 3 percent in 1979 and should ease inflationary pressures. The unemployment rate should remain fairly stable at about 6 percent.

Real personal disposable income will continue to improve in the United States in 1979, though probably at a somewhat slower pace than the 4.1 percent per capita estimated for 1978. The income growth, however, should be sufficient to facilitate a gain in consumer expenditures on food in 1979 at least equal to the increase of about a tenth registered in 1978.

The decline in the value of the dollar in international currency markets this year made U.S. agricultural products cheaper to many foreign buyers, particularly commodities such as soybeans which face few tariff barriers. The behavior of the dollar in money markets next year will depend on the effectiveness of the President's current initiatives to restrain inflation and to bolster U.S. currency values.

COMMODITY SUMMARY

A rundown on the outlook for major agricultural commodities shows varying supply/demand prospects.

Large world grain supplies

World grain supplies are record large for the 1978-79 season. Northern Hemisphere crops now pretty well harvested encountered few problems, with the biggest gains in the Soviet Union, Western Europe, and the United States. Southern Hemisphere wheat crops appear to be rebounding, and plantings of coarse grains are progressing well with the exception of a few problems in Argentina.

Generally good growing conditions in most of Asia point to a record prospective global rice crop, slightly in excess of projected usage.

Weather between now and next spring will determine how close the 1978-79 world harvest will come to the current projection of 1.409 billion tons of wheat, coarse grains, and rice.

Large harvests of the past several years have facilitated rebuilding of global grain stocks to levels not attained since the beginning of the 1970's. This accumulation has occurred despite continued growth in consumption. Carryout at the end of 1978-79 is likely to reach 226 million tons (including rice)—the highest level ever. Stocks that size would represent over 16 percent of world consumption, substantially above the lows around 11 percent in the mid-1970's when supplies were short.

In contrast to last season when foreign stocks declined, larger carry-over stocks are projected for the United States and the rest of the world in 1978-79. Feed-grain stocks in the United States, which are projected to rise over 30 percent this season, have increased each year since the drought-damaged year of 1974-75.

The rebuilding of grain stocks means that the world is much less vulnerable to the kind of massive crop shortfalls and extreme price fluctuations that occurred in the early 1970's. Those events shocked the world, especially the food-deficit nations. The irony is that even with large grain stocks many people will remain inadequately fed until we solve the financial, distributional, and other developmental problems that plague the world.

Unfortunately, a disproportionate share of world stocks is still located in the United States. U.S. wheat and feed grains stocks at the close of 1977-78 were 72 million tons—more than double the amount held two seasons earlier—and the U.S. share of the world grain stocks had nearly doubled in 3 years, to about 40 percent. This compares with the U.S. share of world wheat and coarse grain production of about 22 percent.

By the end of 1978-79, U.S. wheat and feed-grain stocks are expected to rise to over 80 million tons. Nearly 33 million tons or two-fifths of the carryover should be isolated from the market in the newly established national grain reserve by the end of the season.

Current stock levels also should be viewed in conjunction with the outlook for 1979 crops. Because of unusually good crop growing conditions this past season, it is unlikely that grain yields in 1979 will match the record levels achieved in 1978. Thus, while it is too early to speculate on prospects for next year, it seems probable that supply conditions for grains will tighten somewhat.

TOTAL WORLD GRAIN SUPPLY AND USE¹

[Million metric tons]

	1974/75	1975/76	1976/77	² 1977/78	³ 1978/79
Beginning stocks.....	146	134	137	192	185
Production.....	1, 212	1, 238	1, 353	1, 322	1, 409
Total supply.....	1, 358	1, 372	1, 490	1, 514	1, 594
Utilization.....	1, 223	1, 237	1, 298	1, 330	1, 367
Ending stocks.....	134	137	192	185	226
World trade.....	145	170	168	180	172

¹ Wheat, coarse grains, and milled rice.

² Preliminary.

³ Forecast based upon early November conditions and reports.

Wheat.—World wheat output and use reached a new high in 1978-79 with all of the increase occurring outside the United States. However, the expansion in production greatly outpaced the rise in consumption, leaving substantially larger stocks in the rest of the world.

The 12-percent reduction in U.S. wheat output in 1978, combined with record export movement and the isolation of nearly half the 1 billion-bushel 1978-79 carryover in the grain reserve, has tightened markets and improved U.S. wheat prices about a third from the depressed levels of the fall of 1977, to about \$3 per bushel.

With a 20-percent set-aside again in effect for next year, production should fall further in 1979. Wheat prices should hold steady through early 1979, but could face strong competition later in the season as Southern Hemisphere crops move onstream. Farm wheat prices are expected to average in the \$2.80-\$3 range in 1978-79, compared with \$2.31 for 1977-78.

Feed grains.—Global feed grain (coarse grain) production is also expected to hit a record in 1978-79 and exceed the growth in utilization. Carryover stocks are expected to increase in the United States and the rest of the world.

Production of U.S. feed grains—corn, sorghum, barley, and oats—in 1978 is running about 5 percent above 1977's record harvest as record corn yields more than offset a programmed acreage reduction. Stocks continue to mount—from the 30 million tons carried over in October 1977, to 40 million this season, and a projected level of over 50 million next year.

Rapid export movement, expanding domestic feeding, and heavy movement of grains into the farmer-owned reserve—as much as 19 million tons of feed grains by the end of this year—are the major price-bolstering factors. Corn price expectations for the new marketing season (in dollars per bushel) are the following:

[In dollars per bushel]

	1976-78 average	1977-78 average	1978-79 forecast
Corn.....	2.15	2.03	2.00-2.15

WORLD SOYBEAN SUPPLY AND USE¹

[Million metric tons]

	1974/75	1975/76	1976/77	² 1977/78	³ 1978/79
Beginning stocks ⁴	2.2	4.0	5.3	2.2	3.6
Production.....	37.4	45.7	41.0	50.4	53-56
Total supply.....	39.6	49.7	46.3	52.6	56.5-59.5
Consumption.....	35.6	44.4	44.1	49.2	52.5-55.5
Ending stocks.....	4.0	5.3	2.2	3.4	2-5
World trade.....	20.1	24.9	25.5	29.8	29.5-32.5

¹ Meal equivalent.

² Preliminary.

³ Forecast based on early November conditions and reports.

⁴ U.S. stocks only.

Expanding demand for protein boosts oilseed production

World production of oilseeds is projected to increase 6-7 percent in 1978/79, with much of the gain coming from South American crops. Production in 1977/78 had increased about a fifth, with almost the entire expansion coming from the United States where production

increased a third. Brazil should bounce back by about the same proportion in 1977 from its drought-damaged harvest of this past year.

World use of protein meal should continue its phenomenal expansion of recent years and increase about a tenth in 1978/79. The growth results from the rising world demand for animal protein. Total livestock and poultry numbers continue to increase in the major developed nations, particularly the United States, Japan, and Western Europe, as well as in the emerging countries of Eastern Europe and Asia. Demand has also been supported by pressure on the dollar abroad this past season and increased use in Western Europe of "junk feed," which requires heavy protein supplement.

World usage is expected to continue to set new records in 1978/79, though the gain over the past season will probably narrow due to slower demand growth.

Soybeans.—U.S. soybean supplies are record large with the arrival this fall of the biggest crop ever—roughly 1.8 billion bushels. However, domestic use and exports are also records. Foreign demand for U.S. oilseeds should continue strong at least until next spring when the Southern Hemisphere crops come onstream.

U.S. soybean prices have been running around \$6.40 per bushel, more than a dollar above last year's. Prices are expected to average about \$6.50 for the season, compared with \$5.80 last year.

Cotton supplies off somewhat

In contrast to expanding world grain and oilseed supplies, cotton production is falling in 1978/79—a decline in U.S. output is the main cause. Current prospects point to a global crop of around 60 million bales, down from 63.5 million last season. Use and trade are expected to expand and bolster recent market strength.

The U.S. crop is currently estimated at 11 million bales, compared with 14.4 million last season. Mill use is running behind last season's despite prospects for an improving denim market. Even with a smaller U.S. crop, exports are expected to be up from last year and contribute to carryout stocks about 1 million bales below this season's 5.3 million-bale beginning level. However, the range of uncertainty on the carryover is unusually large because of the undetermined effect of poor growing and harvesting conditions on this year's U.S. crop.

WORLD COTTON SUPPLY AND USE

[Million bales]

	1974/75	1975/76	1976/77	¹ 1977/78	² 1978/79
Beginning stocks.....	25.8	31.3	24.2	21.1	24.0
Production.....	64.4	54.0	57.4	63.5	60.4
Total supply.....	90.2	85.3	81.6	84.6	84.4
Consumption.....	58.3	61.0	61.1	60.8	61.9
World trade.....	17.4	19.3	17.5	18.9	20.1

¹ Preliminary.

² Forecast.

Tighter world sugar balance

Current prospects suggests global 1978-79 sugar production will fall slightly short of the 91 million tons produced in 1977-78. A close balance between world production and consumption in 1978-79 is likely.

World sugar prices have already strengthened considerably. In July sugar prices averaged 6.42 cents per pound (Caribbean basis), raw value. In October, world prices were running at 9 cents per pound. Prices in 1978-79 are expected to continue sensitive to supply-use prospects and related world and U.S. sugar policy developments.

World cattle herds down; other livestock expanding

Cattle.—World cattle numbers have been worked down further in 1978. Declines have occurred in the United States, Canada, Australia, New Zealand, Argentina, and Uruguay—the main cattle-producing and beef-trading nations of the world. In these areas, beef production will decline for the next several years and prices will continue to advance. On the other hand, herds are increasing elsewhere in Latin America, and in Europe, the Soviet Union, and Asia.

Cattle numbers in the United States continued to decline in 1978 from their peak of 132 million head in 1975. The herd at the beginning of the year was 116 million and could be as low as 110-112 million next January 1.

Reduced U.S. beef production—4 percent below 1977—in the face of rising consumer demand led to a 50 percent increase in cattle prices last spring. Cattle producers who had been operating at a deficit for 2 or 3 years have finally begun to see some profits. This pattern should continue in 1979.

Numbers of cattle on feed are increasing substantially in the United States. On October 1, there were 16 percent more cattle in feed lots than last year. This will provide increased fed beef production into next year. In fact, fed beef output will exceed year-earlier levels for all of next year.

Total U.S. beef production will be down possibly about 5 percent next year, however, because of sharp cuts in cow and other nonfed slaughter. Thus cattle prices are expected to rise, although more modestly than this season.

Hogs.—Expanding feed supplies are encouraging hog production in many areas of the world. Big gains have occurred in Eastern Europe, the Soviet Union, Japan, and several other countries. Meanwhile in the United States, weather and disease problems, other income opportunities, and structural changes in hog production have kept gains modest despite high hog prices and attractive feed margins.

Poultry.—Poultry output is on the upswing in most parts of the globe. This expansion stems from the growing demand for meat, reduced supplies of competitive meats, good feed-price relationships, and the production efficiencies inherent with the industry. U.S. poultry output increased 8 percent this year and a 10 percent advance is likely for 1979.

Dairy supply-demand balance to remain tight

Markets for U.S. dairy products are expected to remain strong into next year. Commercial stocks of butter and American cheese are sharply below a year earlier. The decline in milk output probably will continue until early next year. Meanwhile, commercial use is expected to about match last year's strong pace.

This combination likely will result in continued strong prices during the rest of 1978 and into early 1979. Commercial stocks are projected to be modest in early 1979.

OUTLOOK FOR AGRICULTURAL TRADE

World trade prospects mixed

The outlook for volume of trade in agricultural products in 1978-79 varies with commodity. Because of the large supplies in prospect for the coming year, world grain trade will probably decline somewhat. Cotton exports should remain close to the 1977-78 level. Trade in oilseed products, however, should continue to expand.

Another record in prospect for U.S. exports

Dominant factors in the outlook for U.S. farm exports in 1979 are, as in every other year, weather, economic growth, and policies that affect the flow of goods. The volume of farm trade in the balance of 1978-79 depends more than anything else on the outcome of harvests still underway and on 1979 crops. With the vast majority of 1979 crops not even planted yet, forecasting at this point is hazardous to say the least.

Though the supply side is still quite uncertain, I might just mention a few factors on the demand side that will impact heavily on 1979 trade.

Expanding economic growth should maintain the current trend of expansion in world trade of food and feedstuffs.

Continued commitment by the Soviet Union and the East European countries to upgrading diets through imports of food and feed would bode well for U.S. exporters; as would a decision by the PRC to continue to turn to the United States for more food and fiber.

Outcome of the multilateral trade negotiations, progress in other trade forums, and national trade policy decisions in the coming year may broaden the access of U.S. products to important markets.

Added together, these factors make the prospects fairly bright as U.S. agriculture aims for its 10th consecutive year of record exports in 1978-79. Currently the outlook points to about the same volume of grain but more soybeans and cotton in 1978-79. And with generally higher average prices, we forecast the value of exports to total \$29.5 billion, versus the \$27.3 billion record last season.

OUTLOOK FOR FARM INCOME

With world and U.S. markets firming this past year, U.S. farm income may be more than 30 percent higher in calendar 1978 than last year, possibly reaching \$26 billion. It will be the highest in 4 years and the third highest ever. Cash receipts from livestock marketings are running a fifth larger and crop receipts are up slightly, including a big jump for soybeans. Government payments could reach a near record \$3 billion.

The increase in farm income reflects a major development in U.S. agriculture in 1978—the recovery of farm product prices. Prices for all farm products averaged 23 percent higher last month than in October 1977. Cattle prices were running more than 50 percent higher and hog prices nearly 30 percent higher. Wheat prices were up nearly a third and corn and soybean prices were up about a fifth.

Looking at income prospects for 1979 is extremely risky at this time, particularly because of the uncertainty surrounding the outturn of the 1979 crops, most of which are yet to be planted. However,

tenative set-aside programs already announced for wheat and feed grains suggest that grain supplies next year will be in relatively good balance with prospective usage.

On balance, returns to crop and especially livestock producers should increase from this year's levels. But production costs will continue to advance and absorb most of the gross income gains. This would indicate net farm income next year perhaps close to the \$26 billion estimated for 1978.

OUTLOOK FOR FOOD PRICES

Retail food prices are averaging about 10 percent higher this year than last and exceeding the overall rate of inflation. Increases in food prices at retail this year were concentrated primarily in the first half of 1978. The advances stemmed mainly from reduced beef supplies and strong consumer demand. Additionally, prices were pushed up by higher processing and marketing costs and excess rains in California that damaged fresh produce early in the year.

Next year, beef supplies will drop further. Much more poultry and possibly more pork later in the year should stabilize total meat supplies. However, inflationary pressures will continue to push up the costs of the processing and marketing of food after it leaves the farm. This component accounts for roughly 60 percent of the final value of food.

If total food supplies are abundant next year and if inflationary pressures moderate, taking pressures off processing and marketing costs, the average rise in retail food prices could be as small as 6 percent. On the other hand, if weather fails to help and inflation worsens, food prices could rise as much as 10 percent for the year. At this stage it seems most likely we will see a year-to-year advance somewhere between the two extremes, but probably at a rate slightly above the rate of inflation for the rest of the economy.

When we look at retail food prices in perspective with the rest of the world, the prospective impact of food costs on U.S. consumers' budgets is much less ominous. Not only are food costs generally lower in the United States, but U.S. consumers spend a smaller share of their income on food than any other nation in the world. And in the process they enjoy the richest diets.

U.S. INTERNATIONAL AGRICULTURAL TRADE OUTLOOK

(By Thomas R. Saylor, Associate Administrator, Foreign Agricultural Service, USDA)

All agricultural export outlook speakers mention weather as the key to how close their forecasts will be to the final outcome.

Weather is a key, of course, but there are other variables which, it seems to me, are having an increasingly significant impact on export levels. I would like to discuss some of them today.

Certainly weather—particularly drought in the Southern Hemisphere—was an important factor in the surge in U.S. agricultural exports in the last fiscal year. Weather reduced production among our competitors helped generate increases of about one-third in U.S. export volume of soybeans and soybean meal, and wheat and flour. We finished the year with export records totaling \$27.3 billion in value and 122 million tons in volume.

This situation of short foreign supply has helped us to a vigorous start in exports for fiscal 1979. Foreign demand is strong, most notably for soybeans and protein meal. The United States will be the only major supplier of these commodities until the Brazilian soybean crop comes along next spring.

At the same time, wheat export commitments for this marketing year are up by about one-third from a year ago. We expect this pace to continue until the Australian and Argentine crops enter the market after the first of the year.

What this means is that world demand for U.S. agricultural products is expected to continue strong during 1978-79. Despite the record grain crop in the Northern Hemisphere, we project U.S. farm exports will exceed those of last year. Export tonnage may change little, but it looks like improved prices for the major commodities will push us to another record export value of about \$29 billion. That would be 6 percent greater than in fiscal 1978.

At the same time, we are forecasting agricultural imports of \$14.1 billion, which would give us a record surplus in agricultural trade of almost \$15 billion.

The export total, which could range from \$26 billion to \$32 billion, will depend to a large extent on what happens to the Southern Hemisphere crop between now and next spring. But let's take a look at some of the factors beside weather that bear on the level of agricultural exports.

Economic expansion can tell us a great deal about the strength of foreign demand. We expect growth in the world economy to be a bit better in 1979 than it was in 1978—at least the first half outlook is promising. Growth rates are projected to rise slightly in Japan, most of Europe except the United Kingdom, and in Canada, which means

improved demand in these traditional markets. Little change is seen among the OPEC nations, but expansion will continue in most of the non-OPEC developing countries, which are taking increasing amounts of U.S. products.

It is worth noting that growth rates are expected to be highest in the developing countries of East Asia, notably South Korea and Taiwan, which have substantial capacity for continued growth as markets for U.S. agricultural commodities.

The world monetary situation also impacts on U.S. agricultural exports, although the actual effect is difficult to measure. Obviously, monetary exchange rates have little or no effect on exports of products in which trade is impeded by institutional barriers, such as variable levies, or for which demand is inelastic. However, it is becoming increasingly apparent that our overall competitive potential was improved by floating the dollar in the early part of this decade, and that exports of feedstuffs and other products not subject to these barriers benefited from its downward slide in recent months.

Two weeks ago, for example, when the dollar was at its low against the German deutsche mark, the price of soybean meal in West Germany was the same in deutsche marks as it had been 10 years earlier. That can't help but stimulate export sales.

The point is that the impact of the dollar's exchange rate is commodity and market specific. In the bulk commodities, its effects are most likely to be felt on soybeans, which are bound duty-free in the European Community, and to some extent on cotton. Little effect is likely on wheat, and the effect on corn might be termed mixed.

Also important to trade are political factors. These are the domestic and trade policy decisions made in agriculture by our own and foreign governments.

We tend to forget, for example, that while bad weather sharply cut back the Soviet grain crop in 1972, it was a political decision made earlier to improve consumer diets that sent the Soviet Union into the world market for 21 million tons of grain.

They have stayed with that decision—to import rather than cut back on use—in the years since, and this has produced a substantial market for U.S. corn and wheat. Even with a record 1978 crop now expected to exceed 230 million tons, we feel that expanded meat output along with stocks that have been depleted by previous crop shortfalls will lead the Soviets to take sizable imports from the international market.

It appears that the People's Republic of China made a political decision to open its doors to U.S. farm products, resulting in substantial sales of grains and cotton last year and into this year. How wide and for how long the doors will be open will depend on decisions by the Government of the PRC.

These decisions work the other way, of course. The inauguration by the European Community in 1962 of the common agricultural policy (CAP) had a profound and generally negative effect on U.S. agricultural exports.

The introduction of EC variable levies in 1962 destroyed a U.S. broiler market in the Community that had reached over 66,000 tons before the levies were imposed.

Less apparent because it is masked by increases in U.S. grain shipments to the EC, is the restraint on this growth applied by the variable levies of the CAP. The loss can't be quantified, but it is evident from the fact that while annual domestic consumption of grain in the EC has risen by 26 million tons since 1960-61, net imports have declined by about 6 million tons, even though it would have been cheaper for the EC to buy grain from the import market.

This and other EC decisions, such as trade preferences, have been long-term factors in U.S. export trade. We are also seeing a return to more aggressive marketing of grains as the EC confronts the problem of surplus wheat and barley from a record 1978 grain crop and the increased use of feed grain substitutes.

The decision seems to have been made for wheat and barley to move this surplus regardless of the cost or impact on other countries' trade. Exports are being subsidized to dispose of the surplus in third-country markets—an exportable supply of about 5 million tons of wheat and 3 million of barley. The subsidy of \$100 or more a ton on wheat is likely to encourage export sales to nontraditional EC markets, such as Eastern Europe and even the PRC, to the detriment of U.S. wheat sales to those regions.

On feedstuffs, high grain prices have stimulated increased imports of nongrain feed ingredients, such as manioc, bran, fruit pulp, and others. Vigorous French protests of this trend have put pressure on the EC Commission to find solutions to the feed grain substitutes issue.

Several actions are being considered which would affect U.S. exports to the EC during 1979 and the years ahead.

One, for example involves limitations on imports of manioc, which has become a major element in EC compound feeds in recent years. EC manioc imports last year totaled about 4 million tons.

In contrast to grains, manioc is imported at a very low duty. Combined with duty-free soybean meal, it becomes a cheaper feed base than the traditional feed grain/soybean meal mix.

It now appears that the EC will try to enter into an agreement with Thailand, its major supplier, guaranteeing market access but limiting imports of manioc from Thailand—probably to around the present level.

The manioc issue affects U.S. exports of both soybeans and corn—and in opposite ways.

Growth in the use of manioc has generated more use of soybean meal to the benefit of U.S. exports of soybeans and meal. At the same time, manioc as a substitute for grain has cost the U.S. corn exports to the EC that outweigh the gains in soybeans and meal.

The European Community is our largest market, worth \$6.6 billion last fiscal year. On the other side of the world, Japan, a \$4-billion-plus market, has a rice crop that will boost its stocks of rice to about 6 million tons. Stocks of this size hanging over its domestic agriculture are a problem for the Japanese government. Should they decide to try to solve it by subsidizing rice for feed use or into export, trading patterns for the United States and other countries would be affected not only for rice, but for other grains as well.

Decisions like those are being made continuously by governments somewhere in the trading community, affecting agricultural trade to

one degree or another. They may be unpredictable, like the weather. But unlike the weather, they can be controlled, and, as you know, there is an effort under way in Geneva by about 100 countries to reach collective decisions that will influence trade for years to come.

The outcome of these multilateral trade negotiations is uncertain. The United States is working to break the impasse created by the European Community reaction to the pending expiration of the countervailing duty waiver. Meanwhile, much has been accomplished in work with other trading partners, and our target still is December 15 for completion of the negotiations; we think it can be done—and done with meaningful gains for U.S. agriculture.

Another group is meeting in Geneva, trying to work out a set of rules to replace the International Wheat Agreement. I spent last week in that negotiation and will return to it tomorrow.

At this point, the prospects are uncertain. However, we have come a long way in constructing a new agreement. And I think we can complete an agreement which will be in the interest of our producers before the end of the year. But some very hard issues lie ahead.

What is certain in both of these negotiations, is that unless the participating nations demonstrate a confidence in their ability to make and abide by decisions to foster freer, more orderly trade, the pressures to turn inward to protectionism will be insurmountable.

Those are the kinds of factors besides weather that can change the outlook for agricultural trade. They are with us always in some form, but it seems to me they could be of far more consequence this year than in most years past.

GRAIN AND FEED

Turning to the export outlook for the principal commodities in fiscal year 1979, we expect that the record world grain crop will bring a slight reduction in volume of U.S. grain and feed exports. However, improved prices over those of a year earlier, primarily for wheat and sorghum, could push value up by maybe \$500 million from last year's total of \$11.7 billion.

In wheat, world trade is expected to decline marginally under the impact of record or near record crops, with U.S. exports down by perhaps 2 million tons from last year's shipments of 32.8 million tons. Production increases are projected for Canada, Australia, Argentina, Western Europe, the Soviet Union, and India. We expect strong competition in the world market, particularly from the European Community, with its substantial export subsidies, and also from Canada and from Australia, where the weather has been very favorable for late crop development.

The Soviet Union, which has produced a wheat crop estimated at 115 million tons is likely to import the minimum amount of wheat from the United States required under the grain sales agreement, which is 3 million tons. This compares with 3.4 million tons last fiscal year.

On the other hand, the People's Republic of China (PRC), where the 1978 harvest apparently was below plan, is importing grain at a record rate. This year we expect the PRC will import substantially more wheat from the United States than in fiscal 1978.

Shipments to Japan are expected to turn upward again after last year's reduced volume, depending on how Japan addresses its rice

surplus. Increases also are seen in Western Europe outside the Community, and in most of Asia and Africa.

The EC will continue to import high quality wheat for blending, but U.S. shipments are likely to be down somewhat from last year's level of almost 2.5 million tons.

World demand for feed grains continues to increase, but the increase in 1978-79 production to a record of about 732 million tons is likely to exceed gains in consumption. In this situation, the United States will be fortunate to hold the gain made last year, when feed grain exports rose by almost 5 million tons to the level of 55.5 million tons.

Of the three largest U.S. feed grain markets last year—Japan, the EC, and the Soviet Union, each of which took slightly over 11 million tons—only Japan is expected to show an increase. Again, and as in the case of wheat, the disposition of surplus Japanese rice could affect the outcome.

U.S. feed grain exports to the EC are expected to decline under the impact of a record EC coarse grain crop and internal prices that favor feeding of wheat and barley over imported corn. In addition, an exportable EC barley surplus of about 3 million tons is likely to adversely affect U.S. corn exports to third-country markets.

Even after a very poor corn harvest, the Soviet Union is expected to import less U.S. corn because the total Soviet feed grain crop was second only to that of 1976.

This decline should be just about offset by export gains to Eastern Europe, where late rains have damaged coarse grains, and to the PRC, which last year imported no U.S. feed grains.

Brazil, Mexico, South Korea, Taiwan, and Iran also should be good markets for U.S. corn exports in fiscal 1979.

OILSEEDS AND PRODUCTS

The value of U.S. exports of oilseeds and products is projected at \$8.1 billion for fiscal 1979, a gain of 9 percent, as world demand for high protein feeds continues to expand.

We expect above-trend gains in production among our competitors, but a large share of that expected increase will not become available until after Southern Hemisphere harvests next March and April. Meanwhile, U.S. exports of soybeans and meal are expected to increase significantly during October to March, reflecting the short soybean harvest in Brazil last spring. What happens in the second half of the current year will depend largely on the Brazilian harvest next spring.

Some reduction is expected in U.S. exports of soybean oil because of accelerated competition from Malaysian palm oil, and demand for meal is expected to exceed that for oil, which could put downward pressure on oil prices.

The volume of U.S. soybean exports is forecast to rise slightly from the record 19.7 million tons of last year. At the same time, despite record U.S. supplies of 1978 crop soybeans, prices are expected to average somewhat above those of a year ago. This reflects increased domestic and foreign demand, as well as producer decisions to hold beans off the market.

COTTON

U.S. cotton exports are projected at 5.8 million bales, down slightly from those of fiscal 1978, but still the second highest total in the last 10 years.

World import demand is expected to continue strong. In Japan, economic growth is stimulating cotton use, and we see an export gain there. U.S. cotton shipments are expected to be up substantially to South Korea and other countries in Southeast and East Asia, which last year imported almost 3 million bales of U.S. cotton. Their competitive position in the world textile economy remains strong, and their need for imported cotton is rising.

Continued drought in the PRC, which became our fourth largest cotton market last year, held back 1978 cotton production. As a result of weather problems, the Soviet Union may have less cotton to export, especially to Western markets.

In this situation, U.S. cotton prices have been competitive, and, despite a smaller crop, the United States will have a good supply of cotton available for export in fiscal year 1979.

LIVESTOCK AND PRODUCTS

Volume of 1979 exports of livestock and livestock products is likely to be little changed from last year, but higher unit prices should push total export value somewhat above the \$2.35 billion of fiscal year 1978. Prices will be influenced by inflation, strong world demand, reduced supplies of some items, and stronger foreign currencies.

An export decline is expected only in dairy products, primarily because nonfat dry milk now is being sold at "world prices" that are far below those of a year ago.

Shipments of beef and slaughter cattle to Canada are expected to rise because of reduced Canadian production and easing of PBB restrictions. Beef exports to Japan also are expected to increase, and mandatory slaughter to eradicate swine fever in the Dominican Republic may stimulate U.S. pork exports.

Poultry and egg exports are expected to continue to rise, with larger shipments forecast to the Caribbean, Japan, Hong Kong, and the EC.

FRUITS AND VEGETABLES

Export value of fruits and vegetables is expected to continue its upward trend beyond the last year's total of almost \$1.9 billion, despite an anticipated decline in volume.

Short U.S. crops of oranges, grapefruit, and lemons combined with increased competition from Mediterranean countries granted tariff preference by the EC will reduce the volume of citrus exports for the third straight year. U.S. supplies of raisins and tree nuts have been reduced by rain damage.

TOBACCO

We expect an increase in both volume and value of U.S. tobacco exports, which were worth \$1.1 billion last year. The main factors in this forecast are the high quality of the 1978 U.S. Flue-cured

crop, relatively low stocks of U.S. leaf in many countries, and the decline in the value of the dollar, which has held the cost of U.S. tobacco in major foreign currencies to about the same level as a year ago.

In other commodities, exports of sugar and tropical products are likely to increase slightly in value from last year's \$572 million. The value of U.S. rice exports will likely decline from last year's \$833 million, based on the expectation for substantially lower unit prices combined with little increase in volume.

That is what U.S. agricultural trade prospects look like with 10½ months still to go in fiscal 1979—another strong gain to another record of \$29 billion.

As I have reminded you, many factors will affect the final outcome—weather, which is with us always; world economics; and the political decisions on domestic agriculture and trade that are made by governments around the world.

Weather is beyond our control, and the world economy is outside the purview of USDA, but we can, through representation, try to influence government decisions that affect the course of agricultural trade.

AGRICULTURE AND WORLD ECONOMICS

(By G. Viatte, Deputy Director for Food, Agriculture and Fisheries, OECD,
Paris, France)

I am very pleased indeed to be with you today, and I am much honored to be part of the very distinguished panel of this session. Coming from Paris, where OECD¹ headquarters are located, I hope to give you some international perspectives about the issues you are discussing at this Conference.

There are two reasons which can explain my presence here today:

(1) The very active participation of the U.S. Government, and of the USDA in particular, in the work of the OECD; and

(2) The fact that OECD is heavily involved in outlook work, with a view to integrate the sector outlook (in this case food and agriculture) with the general economic perspectives—which is exactly the theme of this session.

As a vast amount of information and assessment has been provided by the previous speakers, I shall limit myself to make a few specific comments, which are certainly not exhaustive, on three individual themes:

—The general economic outlook;

—Issues concerning the food economy, in particular, food prices; and

—Some aspects of the world market and trade outlook.

The general economic outlook

The OECD Economic Policy Committee is going to meet at the end of this week in Paris to discuss the outlook for the next 6 and 12 months. You will understand that this timing prevents me from giving you any indication of the forecasts prepared by the OECD Secretariat. (They will be presented in the next issue of the publication called "Economic Outlook," to be published in December.) In June, OECD Ministers agreed to establish a program of internationally concerted action by member countries to achieve more sustained economic growth, being understood that the action would be differentiated among countries, taking into account their respective economic situation. For example, the program asked a number of European countries and Japan to ensure that the expansion of their domestic demand be greater than in 1977. What I can say at this stage is that such developments seem to be taking place; in particular, in Germany and Japan—a fact which has significant and positive implications for food demand. Prospects for a more steady and balanced economic growth within the group of the developed countries may appear

¹ The Organization for Economic Cooperation and Development includes 24 member countries: Canada, United States, Australia, Japan, New Zealand, and all Western European countries.

somewhat better than some time ago. However, the problem of inflation remains acute in some countries—I will refer to it later.

Going beyond the short-term economic outlook, I would like to make reference to the more basic concept of positive adjustment policies, mentioned already yesterday by Dr. Schuh and which was the object of a declaration by the OECD Ministers in June. What does this concept mean in practice? Certain industries or regions have been seriously hit by the economic difficulties of the last few years; in a number of cases measures have been taken to maintain existing employment and preserve existing productive capacity. But, in the long run, some of these measures may have negative effects; the economy may gradually become less productive and more inflation prone; furthermore, protectionist tendencies may develop. There is, therefore, a need to shift away from these defensive policies toward more positive adjustment policies. This concept should also be applied to the agricultural sector, and here I quote the declaration by OECD Ministers: "Under present difficult conditions with continuing inflationary dangers, it is particularly important to ensure that agricultural policies are designed to achieve their social, economic, and political objectives at minimum cost to the consumer and taxpayer without neglecting the legitimate interests of the agricultural producers and while ensuring the overall food scarcity. More generally, it is advisable to seek improvement in the functioning of agricultural markets as well as in their stabilization." Now, we are discussing within the OECD the ways and means by which much positive adjustment policies could be applied, both for factor markets (labor, capital, and land) and for product markets, and both domestically and internationally.

Inflation and developments in food prices

A striking feature of recent price developments has been the large differentials in inflation rates between OECD countries. Figures for the last 6 months ending September 1978, expressed at annual rates, range from 10 percent in the United States, and 0.4 percent in Germany for example. Japan is halfway with 5.7 percent. In September alone, Germany, Austria, and Switzerland recorded negative rates of inflation (about minus 0.3 percent). Obviously, these figures reflect to a large extent the changes in exchange rates, which had very favorable effects for the price developments in countries with highly valued currencies.

The high rate of inflation recorded in some countries, such as the United States, is a serious source of concern for the OECD; it creates adjustment problems domestically and makes much more difficult the return to more orderly conditions in the international economy, particularly on the exchange rates market.

As far as food prices are concerned, the major problems arose in Canada and in the United States, where the rate of increase for food prices was much higher than for the total CPI in the last 12-month period. In Japan, the EEC, and most European countries, inflation rates for food were more or less equal to the overall inflation rate, or in some cases even lower. Generally speaking, this relatively favorable situation of those countries could be expected to continue, as the overall level of supplies should be adequate to meet demand, including in the next sector (in contrast with the North American situation);

however, there are always risks of disturbances on some specific markets, such as fruit and vegetables, and a further improvement in value of the dollar would, of course, limit the advantages for the importing countries (this import would be felt for soybeans more than for feed grains, in the case of the EEC).

For the United States, it should be hoped that the worst scenario presented by J. B. Penn will not materialize because it would have a very serious impact on the United States and even the world economic conditions. In any case, I hope that this excellent price forecasting work will also be undertaken in other countries.

Some features of the trade and market outlook

As this outlook has been presented in detail by the previous speakers, in particular Mr. Ahalt and Mr. Saylor, I shall limit myself to a few general remarks.

The record level of production of cereals (and possibly soybeans) and the record level of cereals stocks (about 6 percent of consumption; therefore, close to the target fixed by FAO for world food security) are likely to be achieved without exerting too depressing an effect on prices, which have indeed recovered from last year's low levels. This situation may maintain producers' confidence at a satisfactory level, and avoid any overreaction which would have led to medium-term instability. Two major reasons can explain this favorable situation: a much stronger demand than expected all over the world, and the set-aside and reserves policies implemented by the United States.

In nearly all OECD countries, demand for meat has been very strong, and in most cases stronger than expected in view of the general economic conditions. The factors which affect meat demand would require a fresh and indepth analysis in order to get a better understanding of consumers' behavior. In Europe and in Japan, pigmeat and poultry meat production has increased in 1978 and is expected to continue to do so in 1979: The steady growth of pigmeat production in Western Europe taken as a whole is a remarkable phenomena, if compared with the U.S. situation and with the traditional cyclical variations experienced in the past. Both Japan and Western Europe forecast increased import demand of soybeans. The picture for import demand of coarse grains by the EEC is more uncertain in view of the big increase in wheat production (plus 8 million tons) and coarse grains production (plus 4 million tons); as already mentioned at various occasions. The increased export availabilities of wheat and barley by the EEC, as well as by Australia and some other countries, will have an impact on the world cereals market. The materialization of the expectations for the next soybean crop in Brazil is also surrounded by some uncertainties, and will require a close monitoring.

However, the major uncertainties affect the medium-term developments, which have not been very much discussed so far in this Conference. The relatively favorable supply situation at the world level may not occur again the next few years: Stocks would be sufficient to cope with an emergency situation, but not with a series of successive bad crops in many regions of the world. The food needs of the developing countries remain the key problem: It is enough to recall in this context the forecast recently published by the World Bank of a cereals deficit of 53-60 million tons in developing countries by 1985.

The real problem with which policymakers are confronted with is to ensure that the present favorable situation could continue in the medium term, to the extent that policies, and not only climate, have some power in this respect.

The present season (or the next one) may see the implementation of new agreements for some commodities such as wheat, coarse grains, beef, or dairy products. As the content of these agreements is still not agreed upon, it is impossible to predict what their impact on the market situation could be in the future. But three ideas have to be kept in mind:

- (1) The implementation of the agreements would require a close monitoring of the market situation and outlook, and concerted actions by participating countries. The agreements will not provide an automatic solution to the market problems; in a sense, the negotiating process will have a permanent character;

- (2) Although separate agreements will deal with a limited number of commodities, it will be necessary to take fully into account the increasing interdependence between the various products in the context of the feed/livestock sector; and

- (3) Domestic policies will retain a high degree of autonomy, but it will be necessary to ensure that they are implemented in a way to contribute to the achievement of the general objectives of international cooperation in the food and agricultural field, that is, more efficient use of existing resources, orderly growth of trade, market stabilization, and food security.

AGRICULTURAL INPUTS AND PRODUCTIVITY



TRANSPORTATION OUTLOOK, 1979 AND BEYOND

(By Barbara L. Schlei, Administrator, Agricultural Marketing Service, USDA)

Forecasting any kind of economic activity is inexact. Forecasting demand for transportation may be more difficult than most other forecasting because it is a derived demand, dependent upon the combined demand for all products which share a common transportation system.

In the first part of this paper, the Department reviews some immediate past trends for selected commodities, concentrating on grains and fresh fruits and vegetables, and offers the outlook for the coming years based on commodity projections. Also, the status and outlook regarding adequacy of grain storage is covered. In the second section, current problems are discussed, and USDA offers its views on potential solutions and what the Department is doing to help.

GRAIN (INCLUDING SOYBEANS)

The outlook for the availability of inland transportation to move grain during the 1978-79 crop year is not favorable.

Indications point toward a continuation of the transportation shortages that have plagued the agricultural community over the past year. Total grain production for 1978-79 is projected to be 3.4 million metric tons above the record 1977-78 crop year. Domestic demand for grains is expected to remain stable and export demand should increase slightly from its recent high level. Transportation capacity is not expected to increase rapidly enough to meet the consistently high levels of demand, unless a greater share of the total capacity is allocated to grain.

Anticipated movements

Beginning grain stocks of 76.7 million metric tons combined with a projected total production of 312.8 million metric tons will provide a total grain supply of 389.5 million metric tons for the 1978-79 crop year. Total off-farm movement is projected at 236 million metric tons—compared to a yearly average of 225 million metric tons for the 1975-77 period.

Heavy exports will continue to have a major influence on transportation demand. Exports for the 1978-79 crop year are projected at 109.1 million metric tons—approximately 46 percent of total grain movement—compared to an annual average of 98.5 million metric tons for the 3-year period 1975-77. Expansion in world production is not expected to increase more rapidly than demand caused by economic growth. The United States should maintain its strong export position for several years.

Domestic movements for the 1978-79 crop year are expected to increase by approximately 0.8 million metric ton over the 1975-77 3-year average of 126.5 million metric tons.

Modal contributions

Motor carriers have made a significant contribution to the movement of grain. The operational flexibility and supply elasticity of trucking make it vital to grain transportation. On many occasions trucks have taken up the slack left by equipment shortages of other modes. With increasing rail line abandonments and rapidly escalating rail rates trucking will become financially more attractive, allowing continued expansion.

Barges haul substantial amounts of grain, particularly in export trade. For the period January through September 1978, barges moved 31.7 million metric tons of grain compared to 27.3 million metric tons for the same period in 1977 and 30.7 million metric tons in 1976. It has been estimated that from 1973 to 1977, barges increased their share of export grain movements from 20 percent to 39 percent. Available figures indicate that barge ownership has been increasing at an average rate of about 1,500 per year.

Barge movements on the Upper Mississippi are sharply curtailed during the winter when freezing closes the upper inland rivers from December to April. Operational problems with river locks from St. Louis upstream also impede the flow of river grain movements. Despite seasonal restrictions and lock limitations, (which will probably continue during the construction of a new lock and dam 26 at Alton, Ill.), water movements of grain should expand apace with exports for the coming year. The long-term outlook may be a declining rate of expansion after waterway user taxes go into effect late next year.

Demand for railcars

The railroads' share of off-farm grain movements was approximately 91.7 million metric tons for the 1975-76 crop year and 95.1 million metric tons for the 1977-78 crop year. If the railroads maintain a constant market share, they must meet the demand to move 105.5 million metric tons in 1985.

For the first 10 months of 1978, railcar supply fell drastically short of demand. Because of the near-crisis car shortage, grain shippers lost sales, late delivery penalties were incurred, deferred sales resulted in added carrying charges and higher cost trucking was used to move grains stranded by car shortages. The Association of American Railroads reports that in January 1978 the average daily shortage of covered hopper cars was approximately 9,000 cars. The shortage gradually intensified to a record high of over 35,000 daily shortages for the month of April and fell to 15,000 for July and 7,000 for September. (See table 1 and chart 1.)

GRAIN MOVEMENTS AND CAR SUPPLY

% OF 1974

MONTHLY AVERAGE

CHART I

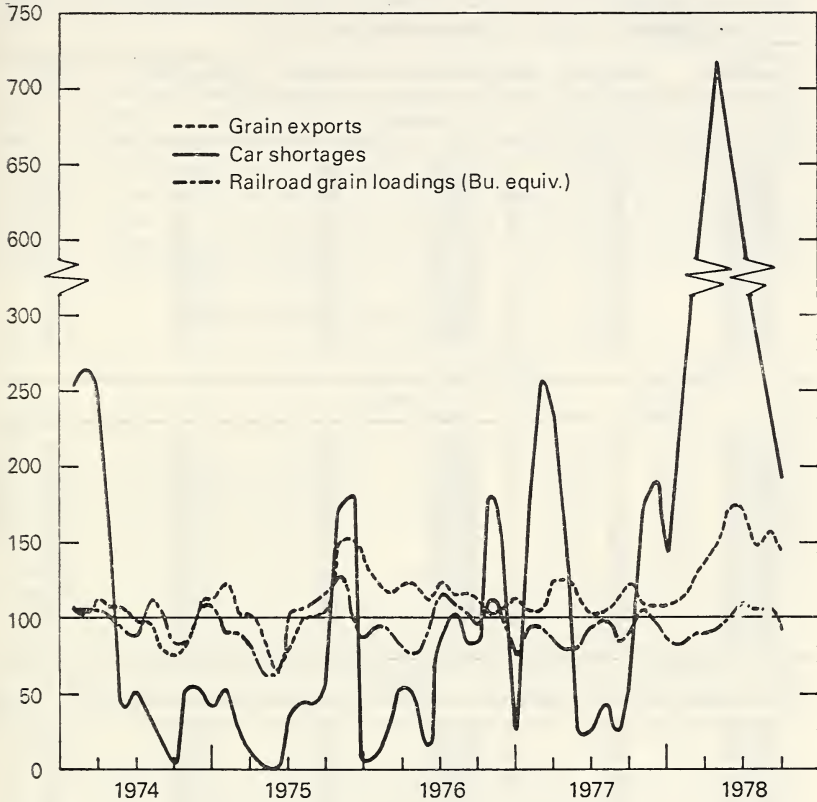


TABLE 1.—GRAIN MOVEMENTS AND CAR SUPPLY

[1974 period average = 100]

1974

Rail originations ¹		Inspection for exports ²		Peak daily ³ C/H shortages	Monthly index
Bushels (thousands)	4-week index	Bushels (thousands)	Monthly index		
347,552	108	J 262,724	109	13,069	253
343,069	107	F 247,767	103	13,661	264
340,074	106	M 270,027	113	12,741	246
325,409	101	A 258,477	108	7,246	140
289,952	90	M 256,323	107	1,959	38
281,917	88	J 233,487	97	2,655	51
364,386	113	J 233,444	97	1,687	33
344,074	107	A 192,048	80	1,055	20
271,497	84	S 180,760	75	186	4
272,663	85	O 205,409	86	2,808	54
358,158	111	N 267,755	112	2,829	55
349,270	109	D 271,495	113	2,182	42
290,028	90				

TABLE 1.—GRAIN MOVEMENTS AND CAR SUPPLY—Continued

[1974 period average = 100]

1974

Rail originations ¹		Inspection for exports ²		Peak daily ³ C/H shortages	Monthly index
Bushels (thousands)	4-week index	Bushels (thousands)	Monthly index		
1975					
312, 196	97	J 294, 255	123	2, 830	55
288, 557	90	F 246, 750	103	1, 494	29
285, 910	89	M 244, 621	102	614	12
259, 093	81	A 216, 162	90	148	3
199, 560	62	M 166, 577	69	20	0
207, 801	65	J 190, 217	79	1, 761	34
334, 606	104	J 239, 794	100	2, 288	44
343, 985	107	A 243, 866	102	2, 158	42
352, 335	110	S 255, 589	106	3, 033	59
372, 104	116	O 368, 375	153	8, 862	171
412, 509	128	N 365, 920	152	9, 216	178
328, 241	102	D 328, 205	137	323	6
275, 139	86				

1976

293, 390	91	J 298, 697	124	523	10
304, 319	95	F 298, 296	118	1, 778	34
305, 652	95	M 292, 695	122	2, 909	56
260, 824	81	A 296, 867	124	2, 585	50
243, 769	76	M 273, 561	114	771	15
294, 940	92	J 294, 794	123	4, 304	83
373, 730	116	J 280, 634	117	5, 445	105
358, 149	111	A 281, 945	117	4, 419	85
340, 134	106	S 270, 939	113	4, 258	82
308, 247	96	O 363, 637	152	9, 365	181
364, 036	113	N 353, 341	147	7, 633	148
321, 949	100	D 273, 649	114	1, 387	27
241, 735	75				

1977

272, 275	85	J 257, 862	107	8, 870	171
303, 081	94	F 260, 365	108	13, 283	257
305, 945	95	M 299, 540	125	12, 061	233
277, 046	86	A 300, 843	125	8, 321	161
250, 011	78	M 278, 294	116	1, 236	24
270, 956	84	J 245, 682	102	1, 473	28
296, 908	92	J 257, 031	107	2, 206	43
318, 890	99	A 267, 628	112	1, 299	25
276, 933	86	S 298, 649	124	2, 820	55
302, 106	94	O 264, 230	110	8, 695	168
336, 648	105	N 320, 234	133	9, 830	190
318, 282	99	D 313, 224	131	7, 301	141
275, 184	86				

1978

258, 069	80	J 267, 674	112	12, 280	237
260, 537	81	F 301, 507	126	21, 410	414
281, 547	88	M 333, 722	139	30, 149	583
287, 609	89	A 363, 554	151	37, 201	719
298, 240	93	M 415, 071	173	31, 991	618
328, 593	102	J 400, 067	167	27, 260	527
353, 190	110	J 337, 930	141	20, 202	391
345, 349	107	A 378, 993	158	12, 421	240
343, 863	107	S 330, 714	138	9, 293	180
302, 917	94	O			

¹ Bushel equivalent calculated from grain carloading statistics of the Association of American Railroads.² Grain Market News, AMS, USDA.³ Covered Hopper shortages developed from Association of American Railroads statistics.

Beginning this past October, the soybean and corn harvest began to gradually escalate the shortages once again. The historic seasonal demand has moderated considerably. Car demand has remained high even in normally slack periods. Except for isolated instances, there have been no rail grain car surpluses since the fall of 1977.

Railcar supply

The nature of rail grain movements has changed considerably over the last 15 years with the introduction and rapidly expanding use of the jumbo covered hopper car. The 40-foot, narrow-door boxcar, which handled 62 percent of grain movements in 1970, is gradually becoming extinct. In 1977, 87.5 percent of the total grain volume moved in covered hopper, most of which was in jumbo-sized hoppers. The following table reflects the changing nature of car utilization in grain movements:

PERCENT OF GRAIN HAULED AND VOLUME BY CAR TYPE

Year	Grain car loading		Volume	
	Covered hopper	ND boxcar	Covered hopper	ND boxcar
1972.....	51.9	48.1	61.8	38.2
1973.....	48.7	51.3	58.7	41.3
1974.....	62.7	37.3	74.1	25.9
1975.....	73.6	26.4	82.6	17.4
1976.....	78.6	21.4	86.2	13.8
1977.....	80.5	19.5	87.5	12.5
1978 (9 mo).....	77.5	22.9	85.1	14.9

Source: AAR.

Although use of the boxcar is declining, it is still relied upon in times of acute car shortages as a backup to the covered hopper. During the heavy Russian grain movement of 1973, and again in 1978, use of 40-foot boxcars increased, rather than showing the characteristic yearly decrease.

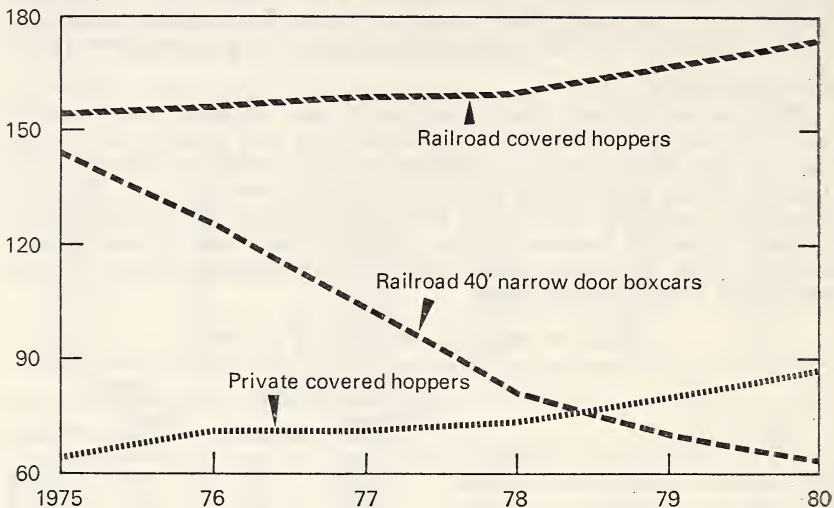
As of September 1, 1978, 40-foot, narrow-door boxcar ownership was at 69,000—compared to 82,000 at the beginning of 1978 and 143,000 at the beginning of 1975. (See chart 2.) The rapid decline in available equipment forces adjustments for individual shippers. There are a number of shippers who can load only boxcars; and there are numerous rail tracks that cannot handle the weight of loaded jumbo hoppers, but can accommodate boxcars.

Since most of the rail-hauled grain moves in covered hopper cars, any long-range improvement in car supply will have to involve increased ownership and/or increased utilization of this type car. Nationally, in 1972, all covered hoppers averaged 17.6 trips per year.

GRAIN CAR OWNERSHIP

CHART II

(THOUS.)



1979 projected.

By 1977, the average had dropped to 15.2 trips. Average trips per year is only one measure of utilization, and a decline does not conclusively demonstrate reduced efficiency. The general consensus, however, is that the trend in utilization is downhill.

Conclusion

Rail transportation shortages of 1978 for grain shippers were severe. Some corrective actions have been initiated. The long-range outlook appears brighter. However, capital is scarce, repair and construction of equipment takes time, old operational practices are difficult to change, and there is no substantial lessening of demand in sight. It appears that the transportation system will fall behind in meeting the needs of shippers in coming months.

FRESH FRUITS AND VEGETABLES

Total tonnage of fresh fruits and vegetables transported in 1979 will be slightly above the 1978 level, continuing the gradual increase during the past 5 years. The amount of refrigerated transport equipment, total truck and rail, should remain about the same. The rail share of tonnage transported will continue to decline to about 8 percent in 1979. On a yearly basis, more than adequate rail refrigerated equipment will be available during 1979; however, spot shortages may be experienced during heavy harvesting when motor equipment is in short supply. The truck share of tonnage transported will continue to grow, reaching about 92 percent in 1979. Based on 1978 experience, no serious truck shortages are expected, except during heavy harvest times, or in the event a truck strike should occur. To the extent ship-

pers buy or lease rail refrigerated piggyback trailers, additional capacity will be added to the perishable transport fleet.

Demand

Fresh fruit and vegetable unloads at 41 cities, approximately 65 percent of the fresh traffic handled, increased 5 percent between 1973 and 1978; and a further increase of 1 percent is projected in 1979. (Table 2.) During this same period the total consumption of fresh fruits and vegetables has increased 6.8 million pounds and is projected to increase an additional 1.3 million pounds in 1979.

TABLE 2.—FRESH FRUIT AND VEGETABLE CONSUMPTION AND TRANSPORTATION, 1973-79

Year	Total ¹ consumption (million pounds)	Total unloads ² 41 cities rail and truck	Trend index (1973=100)	Rail ² unloads 41 cities	Trend index (1973=100)	Truck ² unloads 41 cities	Trend index (1973=100)	Modal percent rail	Share percent truck
1973-----	68,003	732,281	100	172,720	100	559,561	100	24	76
1974-----	68,192	737,637	101	159,508	92	578,129	103	22	78
1975-----	71,564	752,183	103	123,774	72	628,409	112	16	84
1976-----	71,952	757,805	103	96,919	56	660,886	118	13	87
1977-----	73,362	761,635	104	84,867	49	676,768	121	11	89
1978-----	74,803	768,895	105	69,201	40	699,694	125	9	91
1979-----	76,163	776,218	106	62,097	36	714,121	128	8	92

¹ Economics, Statistics, and Cooperatives Service.

² Agricultural Marketing Service, Fruit and Vegetable Division. Truck data are in railcar lot equivalents.

³ Estimated by Economics, Statistics, and Cooperatives Service.

⁴ Projected.

While the tonnage of fresh fruits and vegetables transported has shown a gradual increase of about 1 percent a year since 1973, the shift taking place between transportation modes has been much more dramatic. The railroads' share of fresh fruits and vegetables traffic has dropped from 24 percent in 1973 to 11 percent in 1977, and a further drop to 8 percent in 1979 is projected. The truck share during this same period has increased from 76 percent to 89 percent, and is projected to increase to 92 percent in 1979.

This dramatic shift of fresh fruit and vegetable traffic from rail to truck has occurred for several reasons. The railroads have not maintained a fleet of refrigerator cars of the size required by the fresh fruit and vegetable industry to accommodate the movement of perishable commodities. The available refrigerator car fleet has declined from 46,157 cars in 1973 to 24,776 cars in 1978, a drop of almost half. This drop in available cars, together with deteriorating quality of service offered by the railroads, influenced many shippers of perishable commodities to seek alternative means of moving their products. In addition, rail rates have been increasing rapidly since 1973, and a further substantial increase on fresh fruits and vegetables has been proposed for late 1978.

Supply

The present level of rail equipment for moving perishables appears more than adequate for 1979 and the foreseeable future. However, some spot shortages will probably occur during peak harvest time when motor equipment is in short supply. On a yearly basis there will be excess rail equipment capacity.

While attempting to forecast total supply of refrigerated motor equipment is difficult, no major shortages are anticipated through 1979. This is based on the fact that, thus far in 1978, only minimal spot shortages have occurred, and then only during peak shipping season. Also, an examination of the rates charged for moving fresh fruits and vegetables by truck during 1978 reveals that the rates were generally about the same as the rates charges for comparable movements during 1977.

Finally, during the past year there have been many instances of shippers, or groups of shippers, acting together to purchase and/or lease refrigerated rail piggyback trailers to move their perishable products to market. If this trend continues, it will add additional total transport capacity for the movement of perishable commodities.

FRESH MEAT TRANSPORTATION SITUATION

A primary topic of conversation among meat industry transportation people is the shortage of available truck equipment. The total supply of transportation equipment available to the meat shipper has decreased significantly the past 3 or 4 years because of a rapid decline in rail equipment.

Railroad and car company-owned trailers equipped to haul fresh suspended meat have declined from a total 3,900 trailers in 1973 to 1,300 trailers in 1978, according to the latest AAR figures. Also, railroad-owned refrigerated cars equipped to handle suspended meat have declined from a 1973 total of 7,700 to fewer than 500 in 1978.

Meat is now transported almost exclusively by regulated, for-hire motor carriers. At the urging of some midwestern meat packers and because of a heavier than normal request for emergency temporary authority, the ICC has issued general temporary order No. 14. The order allows a more flexible and expeditious system for handling emergency applications for the transportation of meat by motor vehicle. This will help for-hire carriers who do not presently have authority to transport fresh meat and, thus, ultimately help the packer. This is just a temporary solution. As long as meat transport by truck is regulated, the problem will remain until sufficient operating authority is granted to meet the demand.

FERTILIZER OUTLOOK

All fertilizer mixtures and direct application materials are expected to total about 45 million metric tons during the period July 1, 1978, through June 30, 1979. This is almost a 1-million-metric-ton increase over 1977-78 applications which resulted in record corn and soybean production. By 1985, total fertilizer usage is projected at 55 million metric tons—up about 22 percent over 1977-78.

Much fertilizer moves in bulk form to retailers, hence railroad or barge lines are preferable modes for transportation. About 50 percent of fertilizer sales occurred during the months of March through May. Grain exports are often heavy during this time, placing a heavy demand on rail transportation.

Covered-hopper shortages averaged over 30,000 cars per day from March through May 1978. Fertilizer shippers compete for the same covered hoppers as grain shippers. Some additional fertilizer storage at retail levels has been constructed recently. However, the additional storage facilities are not large enough to offset the great demand for covered hoppers prior to planting seasons.

Currently, locomotive shortages are slowing the phosphate movement from Florida; and car shortages are restricting the potash movements from Canada. It looks like covered hopper car shortages for fertilizer movements again will be unusually high come March 1979. Farmers may not have as much fertilizer available as they would like for spring planting season because of transportation shortages, unless they provide storage onfarm in anticipation of their needs.

AGRICULTURAL TRANSPORTATION DEMANDS BY 1985

Projections for major agricultural commodity movement for 1985 shows substantial increases in transportation demand. Agricultural commodity movements for selected major commodities will show an increase of more than 25 percent over the average agricultural commodity movement for the years 1973 and 1974. This substantial 90-million-metric-ton increase means that more railcars, barges, and trucks, along with improved transportation productivity, will be required to meet the increasing domestic and foreign demands on agriculture by 1985.

Total movement of major agricultural commodities are projected to show increases by 1985, with exception of cotton, peanuts, and sugar which are expected to decline slightly. Grains, including soybeans, the largest users of agricultural transportation, evidence the greatest increased demand—up over 66 million metric tons to 262 million metric tons in 1985 from the 1973 and 1974 average. The largest contributor to the increase is feed grains—up 39 million metric tons—followed by soybeans and food grains with projected increases of about 15 and 12 million metric tons, respectively.

Other heavy users of transportation are fruits and vegetables, each up more than 7 million metric tons in 1985 over the 2-year average for 1973 and 1974, indicating a greater need for more railroad and motor carrier refrigerated transportation.

Putting heavier demand on refrigerated motor carrier transportation will be additional shipments of milk, poultry, eggs, and meats, with a combined increase expected to total about 10 million metric tons by 1985.

TABLE 3.—MAJOR AGRICULTURAL COMMODITY MOVEMENTS, COMPARISON 1985 TO SELECT YEARS

[In million metric tons]

Commodity ¹	1973 and 1974 average		1978		1985	
	Exports	Total movement	Exports	Total movement	Exports	Total movement
Meat ²	0.2	17.6	0.3	19.2	0.2	20.7
Cotton	1.1	2.7	1.2	2.6	1.0	2.5
Peanuts ³ .....	.4	1.6	.4	1.6	.4	1.4
Tobacco ⁴ .....	.4	.9	.4	.9	.3	1.1
Poultry and eggs ⁵ .....	.1	8.3	.4	9.8	.2	10.7
Milk ⁶ .....	.5	53.8	.4	55.8	.2	58.1
Fruit ⁷	2.5	22.5	NA	NA	3.3	29.8
Vegetables ⁸	1.0	39.4	NA	NA	2.0	46.6
Feed grains ⁹	34.2	110.5	54.9	136.0	50.0	149.9
Food grains ⁹	29.8	47.9	33.8	52.6	35.6	59.8
Soybeans ⁹	14.1	37.7	19.9	47.8	23.2	52.8
Sugar ¹⁰		10.5	.2	10.0	.3	10.3
Total	84.3	353.4			116.7	443.7

¹ Commodity data in respective crop years.² Carcass weight.³ Farmers' stock basis.⁴ Farmers' sales basis.⁵ Chickens and turkeys in ready-to-cook weight.⁶ Milk equivalent.⁷ Fresh equivalent includes canned and frozen.⁸ Fresh equivalent includes canned and frozen Irish and sweet potatoes.⁹ Does not include grains or soybeans fed, stored, or otherwise used on farms where grown.¹⁰ Raw value—equals less than 100,000 tons.

Source: 1985 projections unpublished data compiled in the National Economic Analysis Division, and current year data from "Agricultural Supply and Demand Estimates" and situation reports for respective commodities from Commodity Economics Division, ESCS, U.S. Department of Agriculture.

A look at agricultural exports for all the major commodities shows a total of 117 million metric tons by 1985, up about 32 million metric tons over the average movement for 1973 and 1974. Grains and soybean export account for much of this increased transportation demand, totaling 109 million metric tons in 1985 with a 31 million metric ton increase over the 1973 and 1974 average.

GRAIN STORAGE

Adequate grain storage and drying facilities afford marketing flexibility. Storage permits farmers to hold grain until prices rise, thus giving some stability to the market. It is also a necessary, though by no means sufficient, condition for seasonal pricing of transport services to be potentially effective in smoothing out seasonal peaks in the demand for transportation. And, of course, storage is necessary for a reserve program.

Last year, as a result of record supplies of grains and soybeans, shortages of storage capacity were reported in several producing areas. USDA's Agricultural Stabilization and Conservation Service conducted a comprehensive survey through its network of county offices to discover the amount of existing storage, both on farm and off farm. The survey was made in response to growing concerns over the adequacy of available storage to handle this year's crop. The survey indicated that as of April 1, 1978, more than 16.9 billion bushels of grain storage capacity existed in the United States, including 9.9 billion bushels on farm and almost 7 billion bushels off-farm commercial storage.

The amount of on-farm storage put in place during the past year exceeded all expectations. The building boom has been partly in

response to prior shortages, but also in significant measure to the farmer-owned reserve program. The 25-cent-per-bushel storage fee which the farmer earns by committing grain to 3 years in reserve has provided considerable incentive to build on-farm storage.

The rate at which investment in on-farm storage is being made currently is not known with certainty. However, USDA estimates that a large majority is financed under the farm facility loan program administered by ASCS. During the 12 months ending September 30, 1978, farm facility loans representing 753.7 million bushels of capacity were made. Based on loan data, the Department estimates that during the past year and a half on-farm storage capacity increased by approximately 10 percent. In the 6 months following the April 1 survey date, on-farm capacity increased by 330.4 million bushels (again based on loan data), bringing the estimate of total on-farm capacity as of October 1 up to 10.2 billion bushels.

Capacity shortages

Overall, sufficient storage is available. However, with harvests in full swing, spot shortages occur as new crop grain overloads facilities in producing regions faster than it can be dispersed to available storage.

To make available more on-farm storage for the 1978 crop, the Commodity Credit Corporation authorized early forfeiture of 1977 crop corn loans to expedite movement of CCC acquired corn before the harvest. The CCC has acquired more than 22 million bushels of corn under the early forfeiture option. This action was taken to free on-farm storage capacity for the 1978 crop and to reduce the amount of corn that CCC will be forced to move during harvest. During the first 10 months of 1978, CCC loaded approximately 73 million bushels of grain for shipment out of country locations, freeing that much space for the new crop.

The storage outlook is for continued expansion in on-farm facilities, though probably at a declining rate. Spot shortages will exist throughout harvest with some locally severe impacts, but the national crisis in storage which was feared several months ago has not materialized and is not forecast.

CURRENT ISSUES

Railcar shortages

Grain, fertilizer, and cotton shippers today are faced with the worst car shortage in history. Currently, the Nation's railroads daily have unfilled orders for almost 15,000 covered hopper cars. At its height, the shortage was double that experienced during the 1972-73 Russian grain sales.

In April, Secretary Bergland ordered an all-out effort within USDA to assist in easing the railcar shortage. We are working with the Interstate Commerce Commission in analyzing export sales reports, crop reports, estimated commercial fertilizer demand, and other information to maximize the utilization of available railcars and determine future railcar needs. We also established a "hot line" desk at USDA, so that shippers may contact the Department about specific problems, or alert us to serious shortage situations. We are also working closely with trade associations and shipper groups to coordinate the activities and the flow of information, seeking to facilitate quick and effective action on the shortage problem.

However, we are not optimistic that the car shortage will ease substantially in the near future. The shortage of grain cars may extend well into the 1979 crop year.

One of the major problems facing the cotton industry is an inadequate number of suitable railcars. During 1977, the 40-foot narrow-door boxcar, which is preferred by the cotton industry, declined in ownership from 107,269 to 86,081, a loss of over 21,000 cars. Since 1972, there has been a net decline of over 103,000 of these boxcars. The 40-foot, wide-door car declined in 1977 from 27,502 to 23,371. The 50- to 60-foot plain boxcar increased, but only from 155,042 to 155,792. As can be seen from these figures, the favored 40-foot boxcar is rapidly declining in numbers and new 50-foot equipment is slow coming online.

One problem area is the large number of cars which are out of service because of disrepair. According to ICC figures approximately 13 percent of the railroad-owned fleet of 40-foot boxcars are unserviceable.

Not all the unserviceable cars are economically repairable. However, if even a portion of those cars were serviceable, they would provide a significant stand-by capacity for peak-load shipments of grain. USDA recommended to the ICC that it take a close look at any railroad which permits its bad-order ratio to exceed 5 percent. The Commission now has this matter under investigation.

Another area in which we believe the Commission might concentrate some resources advantageously is equipment charges—per diem and demurrage. These are not new problem areas. Many transportation specialists and economists have long felt that the rail industry has never been able to work out a system of charges which reasonably reflect the true ownership cost and/or opportunity cost of the equipment. The natural, economic incentive to improve utilization will come only with equipment charges which do reflect costs.

The equipment charges problem is related to the car repair problem. Many of the now unserviceable cars are relatively old. The current schedule of per diem rates on boxcars is graduated according to the age of the car. The per diem on the older boxcars is so low there is no economic incentive to repair them.

Rail abandonment and rural roads

The Department recognizes and is concerned about the impact that abandoned rail lines have on agriculture and rural areas. While unprofitable lines can be important to the economic life of rural communities, they also pose a threat to the financial viability of the railroad industry and its ability to meet the increasing demand of agriculture and rural industry for adequate and efficient transportation.

More than 10 percent of the rail mileage in the United States is currently classified according to ICC criteria as potentially subject to abandonment within 3 years, under study for abandonment, or subject to a pending abandonment application. Agriculture has a greater stake than any other industry in the future of that 10 percent. The lines which are unprofitable and candidates for abandonment are generally nonindustrial, light density, and rural.

However, where rail lines are abandoned it will mean that more grains and other farm goods will move over the highways and roads.

There are indications that some rural roads and bridges have not been maintained adequately to permit substantially greater levels of economic activity.

Prior to passage of the Railroad Revitalization and Regulatory Reform Act (4R Act), the line abandonment process was significantly different. The ICC could require the railroad to provide service even at a loss where a line was found essential to the public interest. In so doing, the Federal Government forced upon the railroad industry internal cross subsidies in which profits on some traffic had to pay deficits on other traffic. Cross subsidies forced an erosion of railroads' competitive position where rates were higher than they would otherwise have to be.

The 4R Act created a joint Federal-State subsidy program to shift the burden of supporting publicly needed deficit lines to the public sector. The law permits railroads to abandon lines which are unprofitable after a finding that such abandonment is consistent with the public convenience and necessity. Abandonment may take place unless a subsidy is offered to bring the line up to a break-even point (including a nominal profit). To be eligible to receive funds from the Department of Transportation for local rail service subsidy, a line must be included in a State rail plan.

The primary responsibility for identifying lines which should receive public support thus rests at the State level in the formation of these State plans. The problem is to ensure that rail lines essential to the needs of agriculture and rural communities are identified and included in State plans. The Department of Agriculture has developed a program to assist in this important effort. Our effort will be to demonstrate how USDA-related personnel in the States can help the States develop a methodology that ensures the needs of agriculture and rural communities are adequately considered in developing State transportation plans.

We believe we can work closely and cooperatively with the States in this area, beginning with demonstration projects in several States, using our unique network of USDA-related resources at State and local levels—land grant universities, State and county extension staffs, and other county level resources of the Department.

Regulatory issues—rail

The spotlight this year has been on the ICC in its handling of Ex Parte 346, Rail General Exemption Authority, the rulemaking proceeding for establishing procedures for implementing section 12(1)(b) of the Interstate Commerce Act. The new provision, added by the 4R Act in 1976, gives the Commission the authority to exempt selected traffic by rail from some, or all, regulatory requirements.

Historically, the Department of Agriculture has been a staunch defender of regulatory control over the rail industry as necessary in the public interest—particularly for those large segments of agricultural traffic which are economically captive to the rail mode. However, the Department is certainly aware of the changing economic environment in transportation and the plight of many railroads today.

USDA is supporting in principle an experiment in partial deregulation of fresh fruit and vegetable traffic by rail. As yet, no specific proposals are under consideration by the ICC.

Fresh fruits and vegetables offer an ideal opportunity to observe the rail industry at work in an environment almost free of regulatory constraints. The carriage of fresh fruits and vegetables by truck is exempt from interstate regulation. This traffic is carried now predominately by motor carriage, so the question of monopoly power by the railroads is moot in this instance. Also, the question of whether the railroads have the willingness and ability to regain a larger market share under less regulated conditions can be given a market test.

The coming year—certainly the next few years—should see major changes take shape in the area of regulatory relaxation of railroads as the industry, the ICC, and the public adjust to, and define, the radical statutory changes of recent years.

Regulatory issues—motor

Different types of motor carrier operations serve agriculture. For meat, frozen fruits and vegetables, canned goods and other manufactured products of agriculture, much of the trucking is provided by independent owner-operators under lease to regulated carriers holding authority from the ICC.

Another type of trucking operation serving agriculture is that of the agricultural cooperative. These cooperatives may haul traffic for members, unmanufactured products of agriculture, and traffic for other farmers and cooperatives without economic regulation, but all other traffic is restricted to 15 percent of their tonnage.

Truck movement of unmanufactured products of agriculture, such as fresh fruits and vegetables, move unhampered by the rate, route, service, and entry restrictions of the Interstate Commerce Act that apply on other trucking. Unmanufactured products of agriculture, by law, court, and ICC rulings, include frozen poultry, but not frozen fruit; cut-up, cooked, breaded poultry but not meat; cooked fish, but not cooked vegetables; and so forth. Any motor vehicle, whether operated by a private, regulated, or other carrier, can haul these and other unmanufactured products of agriculture free from Federal economic regulation as long as "nonexempt" commodities are not moved in the same vehicle at the same time.

Agriculture thus has had substantial experience with for-hire transportation free of Government economic regulation where prices and services were set by market forces. It has worked very well. Agricultural interests have been firm ever since the Motor Carrier Act was first passed in 1935 in their support of the exemptions. Studies done by, or for, the U.S. Department of Agriculture have yielded findings that such trucking provides efficient and adequate service at reasonable rates.

The stated goals of the Carter administration reflect the current mood of the country for relaxation of economic regulations. Agriculture's experience with unregulated trucking will be given careful consideration in working toward needed reforms.

USDA favors a deregulation of backhaul traffic for all truck movements subsequent to an exempt movement of agricultural commodities. This would give truckers the opportunity to haul, free of regulation, commodities which are fully regulated currently in any circumstance in which they are presently permitted to trip-lease to a regulated carrier. This change in the law is necessary to enable the hauler of agricultural

commodities to operate round trip completely free of regulation—creating for the first time since 1935 a truly exempt sector of the trucking industry.

A second reform USDA favors is an expansion of the current exemption to include farm input items and all processed foods.

A third reform is to increase the present 15-percent restriction on cooperative trucking for nonfarm, nonmember business to the standard 50-percent test which applies on nonmember business for all other types of cooperatives, and to eliminate the restriction that such nonfarm, nonmember business be incidental to the cooperatives primary transportation operation and necessary for its effective performance.

RURAL TRANSPORTATION ADVISORY TASK FORCE

The 95th Congress has passed, and President Carter has just signed, legislation which is potentially of profound significance to the administration of transportation policy, and which is of great interest to agricultural shippers. Public Law 95-580, introduced in the Senate as S. 1835 and in the House as H.R. 12917, establishes a Rural Transportation Advisory Task Force jointly chaired by the Secretaries of Agriculture and Transportation. The task force will have 16 members selected from both the public and private sectors, representing agricultural shippers, the transportation industries, and academia, as well as legislative and executive branches of Government.

The task force is authorized to publish an initial report including recommendations for approaches for determining the continuing transportation needs of agriculture, for establishing a national agricultural transportation policy, and for identifying impediments to a railroad transportation system adequate for the needs of agriculture. After holding public hearings, the task force is required to compile, within 420 days of enactment, a final report which addresses the same issues provided for in the initial report and which contains specific recommendations for a railroad transportation system adequate to meet the essential needs of the agriculture industry. The task force is dissolved 45 days after publication of the final report.

The job which the Rural Transportation Advisory Task Force is directed to do is not easy. But it is a challenge which USDA is enthusiastic about accepting. It affords a unique opportunity for the Departments of Agriculture and Transportation to join forces with users and suppliers of transportation to address problems of mutual interest. We at USDA are looking forward to the coming year.

RAILROADS AND AGRICULTURE: A QUESTION OF NEEDS

(By A. Daniel O'Neal, Chairman, Interstate Commerce Commission)

Abraham Lincoln once told a story of a farmer who rescued his chickens from a hungry fox. The surviving chickens praised the farmer for sparing their lives. The trapped fox, however, saw the same situation from a different perspective. He cursed the farmer as a tyrant who would starve the fox's family.

Lincoln told this story as an illustration of conflicting views of justice—evidence that where you stand depends on where you sit.

The transportation outlook for agriculture in 1979, as far as railroads are concerned, poses a similar dilemma. Like the fox and the chickens, shippers and carriers peer into the mirror of agricultural transportation, but see different reflections. They see different rewards from justice.

Grain shippers in particular demand quality, timely rail service. Their livelihoods depend on it. To them, justice in transportation means efficiency, availability, and reasonable prices.

To the railroads, however, justice has a different face. Many railroads are overbuilt. Many cannot properly maintain their systems and are losing money. Many are fighting to survive and, indeed, some have lost the battle; they've gone bankrupt. For the railroads, then, justice is the freedom to abandon marginal routes, the freedom of high-profit pricing, and the ability to operate independent of the regulatory system.

The ICC is paid by taxpayers to sit as judge, jury, and sometimes prosecutor of the conflicting claims for justice by shippers and carriers.

Now, more than ever before, the adjustment of these conflicting claims requires that we clearly define what it is that we want from our transportation system. What do we need? What do we want to accomplish?

I am reminded of the story of Gertrude Stein who, on her deathbed, was asked, "Gertrude, as you pass from this earth, share with us your wisdom. What is the answer?"

Ms. Stein, so the story goes, replied, "That depends on the question."

Good answers to the hard problems of transportation and agriculture depend on the proper questions, like: What do we want from the transportation system? What are our needs? And how do we meet those needs?

If we really know our goals and expectations, balancing conflicting objectives will—in the long run—be less painful and more productive for all parties involved.

WHAT FUTURE FOR RURAL SERVICE?

During the past year, we've faced the worst car shortage in two decades. Shortages of jumbo covered hoppers and boxcars numbered in the tens of thousands.

To help alleviate the shortage, the Commission issued a number of car service orders. The effect, in many cases, was to force the carriers to make more cars available to shippers of various agricultural commodities. This brought cries of outrage from the railroads—cries that we were interfering with their efforts to make money and improve efficiency.

Providing single cars to rural shippers—such as grain shippers or country elevators—is a laudable goal. Small business and the American farmer have been the mainstays of our economy for two centuries. Government has a responsibility to them, and I agreed completely with the decision to issue orders that would help them obtain cars.

But the railroads have a point. Providing single cars to country elevators and other rural shippers is more costly and less efficient than mainline, unit-train service. It's no wonder that the railroads balk at providing that service, particularly during a car shortage.

Does rural, branch-line service—as we've known it—contribute to the best use of railroads? Does the general public, as a whole, get the most benefit—indeed, is the agricultural community best served—if railroads are required to provide service on demand to small, rural communities?

DIFFICULT QUESTIONS

This is one of the most difficult questions facing us, as we consider the transportation outlook for agriculture in 1979. And it goes right to the heart of the question I asked earlier: What does agriculture want or need from the transportation system?

The answer, as I understand it, is reasonably adequate service at reasonable prices. Whether that service can be provided in the same manner, however, and at the same prices as in the past is another matter. We may very well be forced to redefine "reasonable" and "adequate."

Right now, railroads are facing hard times. In one survey, the railroad industry showed the lowest rate of return on net worth among 73 industries. Other surveys rate other industries lower, but in none do the railroads make an impressive showing. The return on net investment—another economic indicator—is nonexistent for several major railroads in the Midwest. Much of the track system is in disrepair. And many railroads simply cannot finance improvements or adequate service.

Given the financial condition of many carriers, some simply won't be able to continue their present level of service indefinitely, short of Federal subsidy.

Therefore, one question we face is the difficult one of how much rail service and what kind is really necessary for the proper functioning of agriculture? And will agriculture opt for a privately owned rail system that is somewhat less adequate, one that is owned by or subsidized by the Government, or no railroad at all?

INVOLVEMENT BY MANY GROUPS

The answers to these questions require attention by many different groups—agriculture, railroads, labor, and Government. It will take all of us. It will require difficult balancing of many conflicting views of justice.

I encourage the agriculture industry and agriculture officials in Government to explore agriculture's transportation needs thoroughly.

Recently, Congress passed legislation to establish a 16-member task force that will have the responsibility to do just that. The task force will recommend the kind of rail system that is necessary for agriculture. It will identify impediments to an effective system and will make recommendations on a national agricultural transportation policy. I think this is an excellent idea.

The legislation also gives local people—shippers, farmers, businesses—the chance to speak out. Public meetings will be held on what the rail system should look like. I would encourage farmers, shippers, grain dealers, and other agricultural interests to look at innovative ideas and make their suggestions known. This kind of involvement is a must in finding a rail system that serves the actual needs of the public.

SOME POSSIBILITIES

Today, however, I want to present some possibilities that I see regarding the future of rail service in rural areas. They have to be considered in light of the troubles within much of the rail industry. And they are suggestions which might deserve a look by agricultural shippers.

In many respects, these ideas challenge the traditional definition of "needs." In many respects, they would require change or adjustment in present practices. They should cause agricultural shippers to ask themselves: "What are we willing to pay for?"

RURAL RATES

One possibility we must consider for future railroad service is higher rates on branch lines. This would make unprofitable service profitable for the carriers in the face of rising costs. That's not a pleasing prospect to many small shippers, but it must be kept in mind.

It raises the basic question of what agriculture shippers want from the railroads. If it is single car service by all carriers on all branch lines, they can probably have it. But it is going to cost money. Given the financial condition of many carriers, it's becoming more and more unrealistic to expect them to be able to finance this out of their own pockets indefinitely.

ABANDONMENT

Another possibility we must consider for the future is easier abandonment of rural lines. Much of the rail system in the Midwest is in poor shape. To rehabilitate such lines in many cases would be exorbitantly expensive. Would it be worth it?

It's important to recognize that there are many rail services which are either operated at a loss, or which return such a small margin of profit that they are unattractive to the carriers operating them. There's no doubt that many rail services, considered essential by

those who use them, simply cannot be operated profitably at present rates.

Determining just what are essential services and how to keep those essential services in operation, will continue to be one of the major challenges facing Government, the railroads and railroad customers. But at the present level of rail revenues, and without operating subsidies, there are strict limits to the number of unprofitable or marginal services which railroads can be expected to subsidize from other revenues.

Some difficult balancing will be necessary. The needs of the carriers for profits and the needs of the shippers for adequate service must be weighed. It won't be easy.

Again, what is it that agricultural shippers need and are willing to pay for? Do they want marginal service on all branch lines? Or are they willing to give up some branches in exchange for a modified rail system that still provides service and reduces the railroads' operating costs?

This may mean a change in "needs." Perhaps "need" is being treated as synonymous with "expectations."

MERGERS

Merger is another method used by many companies including railroads to strengthen themselves. A number of rail mergers are at various stages of gestation at present.

Earlier this year, in a draft policy statement, the Commission announced that it planned to encourage the rationalization of rail facilities and the reduction of excess rail capacity through appropriate rail mergers. It indicated that it would look at operating efficiencies, marketing opportunities, the retention of essential rail services, and the impact upon competition in deciding what was and was not an appropriate merger.

Any rail merger requires balancing. The agency must look at what the public need really is, as well as the carrier need. We will have to decide what service is essential and whether that service could be provided by some other form of transportation. In many cases, there will undoubtedly be adjustments required by shippers, grain elevators, and the American farmer.

Essential service and public need will be a vital part of any decision we make, but so will rational use and structure of the rail facility.

RAILROAD RATEMAKING—THE 4R ACT

Of course, one of the basic elements I've been talking about here is profitability—money. That's important to carriers and shippers. And that subject is perhaps reflected no more clearly than in the area of ratemaking and the future of railroad rates.

Unless the railroads earn enough revenue to cover their costs and return enough profit to retain and attract capital, the industry will decline to the point where it will be unable to serve anyone's definition of the public interest. Absent, of course, a Government subsidy.

There's no free lunch and there are no free railroads. Nor any inexpensive ones either. Neither the ICC nor anyone else can keep the railroads running by Government fiat.

I am in no way suggesting that the railroads should have license to make captive shippers shoulder an excessive burden. The Commission has a responsibility and a commitment to ensure that that does not happen.

However, the 4R Act gave the carriers considerable flexibility in pricing their services where there is competition. They have not as yet taken full advantage of that flexibility. I think they should.

Indeed, today the Commission is very open to innovative rate proposals. And the opportunities exist for the railroads in such areas as seasonal rates, peak-period and demand-sensitive rates, distinct services, or wherever they have competition or anywhere they propose a reduction. Rather than filing general increases that affect thousands of shippers and all kinds of service, carriers should use pricing as part of their marketing strategy.

The railroads should use this opportunity to increase their profits. They should use the flexibility of the 4R Act fully, which they have not done, before returning to Congress with another one of their perennial requests for a change in Government policy.

Again, changes in rail rates raises the question of what it is we want from the railroad system. If it's a rail system of the same size as we now have, using a pricing system similar to today's, additional Government support will be necessary. Some new ways of doing business will be necessary to obtain a contrary result.

Adjustments in the old way of doing things is a reality that must be faced, and that reality tugs at the long-accepted understanding of what the needs of the agricultural industry really are.

LOCAL RAIL SERVICE ASSISTANCE

So far, I've mentioned possibilities that may look somewhat bleak to farmers—higher rates, more abandonment, changes in the rail system. But I think some additional choices do exist—choices which could hold benefits both for agriculture and the railroads.

First, there is the Local Rail Service Assistance Act of 1978, which was recently passed by Congress. Among other things, that legislation provides Federal assistance to States to rehabilitate essential lines before they are abandoned. This will allow States to get ahead of the problem. They'll have a better chance of saving what they consider to be essential lines.

That's going to take some work on the part of the States and the agricultural shippers, though. They will have to take a good look at what is essential and what isn't.

A similar program has worked well in the State of Iowa for some time now. In cooperation with railroads and shippers, that State has been taking a close look at its rail system. They have developed a process which, after some analysis, determines which lines are essential and then—through joint funding involving railroads, States, and shippers—rehabilitates those lines. That same approach is necessary in more States. It shows the way for cooperation and for planning.

Local people, along with the States and the railroads, should decide what they want from their rail system. They should decide which lines are necessary, which lines aren't. They should decide what is vital to their well-being and what they can live without.

When States and local communities do that kind of planning, they are well on their way to dealing with the realities of railroad transportation in years to come.

The Local Rail Services Assistance Act also provides funds for the cost of constructing rail or rail-related facilities. This includes new connections between existing lines, intermodal freight terminals, sidings, and relocation of existing lines. All of this is designed to improve the quality and efficiency of rail freight service.

Such assistance obviously can mean a lot to shippers and States. But I think there may be more potential here than meets the eye.

CENTRALIZED ELEVATORS

I wonder how often there have been a number of shippers waiting for single cars on separate lines or at different stations on the same line, all in close proximity to one another? Those shippers would undoubtedly have a much better chance of receiving reliable service if they all used a single elevator. If they did, the railroads might be convinced to rehabilitate that one line to top quality and could provide more adequate and perhaps less costly service.

Such a system, it would seem, could benefit shippers as well as carriers. Obviously, this idea would have to take into account the grain dealer and the role he plays in where grain is stored. But it's an idea worth considering.

The Local Rail Service Assistance Act might fit well into this kind of approach. It could be used to provide Federal assistance to encourage centralized elevators. If a group of shippers wanted to give up their branch lines in exchange for top-quality service on a single line, this legislation could provide funds to help upgrade the line; to build a spur, perhaps, or to help with loading facilities; or maybe even to build a new line.

This holds potential for the rail industry and the agriculture industry. It might be a first step toward constructing an agricultural shipping system that is more efficient and less costly overall for all parties.

Another possibility that may produce benefits for shippers and carriers is contract rates. Just last week, the Commission lifted a de facto ban on long-term contract rates between shippers and railroads. Contract rates could hold some potential for both industries.

They could lead to a continuing source of business for the railroads which they could count upon and plan upon. They could also lead to lower rates for shippers and a guarantee of service over an extended time period.

Contract rates might mean that railroads could invest in more equipment, knowing that a certain amount of unit-train service from one point to another would be available for a number of years. Such rates could even make more cars available to smaller shippers.

It must also be recognized, of course, that contract rates tend to be anticompetitive because they freeze out competitors. Thus, they may not fit every situation and need to be used with some care.

CONCLUSION

Clearly, the 1979 outlook for transportation is change. The railroads will be affected. Agriculture will be affected.

Someone said that although change is difficult, it is the only road to progress.

If shippers and carriers can realistically come to terms with what they need in light of what is possible, much pain and agony can be avoided. It is time to begin the joint search for sound, practical alternatives that can benefit all parties.

To begin the process, all those involved—shippers, carriers, farmers, grain dealers, Government officials—must be willing to acknowledge the facts and recognize that conflicting views must be dealt with.

They must recognize that easy solutions don't exist—solutions that will likely make every party happy all of the time or give everyone what he has come to expect.

My advice is for agriculture to be truthful with itself. The railroads must also be truthful, but for now, I'm limiting my free advice to agriculture. It should identify goals that fully reflect the transportation scene and its own transportation needs. And it must work with carriers in a realistic way to find good, workable solutions.

Above all, before this process can be truly effective, the agriculture industry must know what it wants, what it needs, and what it expects to accomplish.

The answers to the questions must come in a form that has meaning to the individuals most directly affected. And it should come in a way and with such timing that planning will be possible.

We can either anticipate and manage change to the mutual benefit of all involved, or we can be swept away by it. I hope we choose to manage it.

THE TRANSPORTATION OF AGRICULTURAL COMMODITIES TODAY AND TOMORROW

(By John J. Fearnside, Deputy Under Secretary, U.S. Department of Transportation)

Over the past 30 years, major changes in our transportation system have occurred. The railroads were once the dominant carriers of freight in the country. Today, railroads have to fight to hold onto what traffic they still carry. Much of the traffic once thought to be captive to railroads is now moving by motor carrier or barge. In the days when railroads were brought under regulation, society was preoccupied with protecting the public from railroad monopoly power. But since then, intermodal competition has increased enormously. As a result, our major preoccupation with railroads tends to be assuring that they remain solvent members of our private sector economy.

President Carter has emphasized repeatedly his determination to eliminate unnecessary and counterproductive regulatory constraints on market activities. The view was expressed most recently in the President's anti-inflation speech where he urged regulatory reform of motor carriers and railroads. Even before the President's latest speech, Secretary of Transportation Adams had initiated the development of an approach to comprehensive regulatory reform in the context of his overall transportation policy goals.

In very broad terms, the overall objective of the Department of Transportation (DOT) is a healthy and rational transportation system which serves well the economic and social life of this country. We believe that economic regulatory reforms of surface transportation are essential to achieving this goal. The more competitive environment created by such reforms should enhance the efficiency and productivity of our private transportation sector and lead to a healthier overall system. As we develop our economic reform initiatives, however, we will be mindful of the potential social impacts of such initiatives. Our policies will incorporate our concern for, among other things, the safety and availability of our transportation system and the impact of the transportation system on our environment and on the use of energy resources. In addition, our transportation policies should foster fair and evenhanded treatment of the various modes. This requires that we address not only inequitable economic regulations but issues of cost allocation and related user charges for each mode.

With these overall policies in mind, DOT is preparing a comprehensive package of railroad and motor carrier regulatory reform for President Carter. As a major part of that process, we at DOT are carrying on extensive discussions with shippers, carriers, and other Government agencies to determine precisely what changes to our current regulatory system are needed. In that context, I look forward

to carrying back your comments on how the regulatory system should be changed. We will then be able to integrate your thoughts into our ongoing development of a comprehensive legislative proposal.

Today, I would like to review the changes that have been occurring in the transportation marketplace, changes that have led to our current thinking. I will then examine the current state of intermodal competition. Finally, I will summarize DOT's views as to how we can improve the agricultural transportation system. In particular, I will examine the means of improving the agricultural exempt motor carrier's ability to carry manufactured goods on the backhaul and the benefits railroads and shippers can derive from contract rates and increased pricing flexibility. The reduction of constraints on exempt motor carrier operations and the improvement of the railroads' ability to compete with other modes will improve the quality of transportation service available to the agricultural sector.

POSTWAR GROWTH AND CHANGES IN THE TRANSPORTATION SYSTEM

Between 1947 and 1976, U.S. industrial production increased by 37 percent and real gross national product increased by 33 percent. Our transportation system kept pace with our industrial growth. Inter-city ton-miles of regulated and unregulated for-hire carriers of all modes increased 32 percent to keep pace with the growth in industrial output. Throughout the period, the cost of freight transportation remained stable, accounting for a constant proportion of gross national product, approximately 8.5 percent. But these stable figures disguise drastic changes that occurred within the transportation industry.

During the period, the share of total traffic carried by each of the surface modes has changed dramatically. In 1947, railroads accounted for 70 percent of intercity freight revenue and 65 percent of tonnage. For-hire motor carriers accounted for 20 percent of the revenue and 10 percent of the tonnage, and water carriers, pipelines, airlines, buses, and freight forwarders accounted for the rest (1). By 1976, the railroad share of total freight revenue had declined to 37 percent and their share of tonnage to 36 percent. Motor carrier revenue had risen to 51.7 percent of freight revenue and their share of tonnage to 23 percent (2). Throughout the period, tonnage carried by private trucks, and not included in the total tonnage figures, is estimated to have risen dramatically. The amount of traffic carried on the waterway system also increased dramatically.

U.S. TRANSPORTATION SYSTEM TODAY

These changes in shippers' choice of mode that have occurred over the past 30 years have encouraged evolution of strong motor carrier and barge industries. Both the generally robust rates of return earned by barges and motor carriers and the substantial rates of growth in the traffic carried by both modes attest to their strength and well-being. The evidence available to us, however, suggests that improvements can be made in the regulatory system which could improve their operating efficiency. Our railroad system, however, has suffered from serious deterioration in its ability to provide service. The productive centers of the country have shifted, leaving the railroads with much redundant and underutilized capacity. In addition, increased

intermodal competition and the consequent shift of traffic from railroads to other modes has left railroads with insufficient funds to maintain their existing plant. Yet the present regulatory system inhibits railroads from adjusting their physical plant to correspond with present market demand.

The result of this process is that today, few if any railroads are earning rates of return sufficient for longrun survival though many railroads, for the moment at least, remain viable transportation companies. Many other railroads are in perilous financial condition or in bankruptcy. Notwithstanding the relative decline in demand for railroad services, and the perilous condition of many carriers, however, railroads still make up an important part of our transportation system.

In light of this state of affairs, a great deal of thought has been given to how to keep our railroads operating and in the private sector. There is a consensus today on at least two significant points: (1) That our rail system must be pared down to a manageable size, and (2) that it must be preserved as a part of our transportation system.

THE ROLE OF GOVERNMENT IN PRESERVING RAIL SERVICE

The policy of the Secretary of Transportation is to assure that railroads do not become dependent on continuing and evergrowing Federal subsidies. To the extent a railroad receives subsidies from the Government, we believe that the size of the subsidies should be progressively reduced and ultimately eliminated. At the same time, we must assure that essential transportation services continue to be provided. Reducing Government subsidy to all modes does not mean that we must eliminate essential transportation services. Quite the contrary: careful planning, transition aid, and greater reliance on the market system are means that we will be able to use to permit eventual reduction in Government involvement in the transportation system. These considerations were hallmarks of the recently passed Local Rail Service Assistance Act of 1978, the branchline bill.

The Department of Transportation is working to encourage railroads to rationalize their structure by consolidating branchline operations in an orderly manner over a number of years. In addition, DOT has consistently encouraged local communities or groups of shippers to subsidize existing lines whenever they believe the benefit of continued branchline service is sufficiently great to justify a local service continuation subsidy. The Local Rail Service Assistance Act of 1978 works toward that end by providing limited transitional aid to allow for continued service during periods of consolidation of lines. Equally important, it provides funds with which to rehabilitate branchlines in those instances where there is a reasonable probability that, once rehabilitated, the lines will become viable self-sufficient entities.

The branchline program is designed to provide the States with limited transition assistance over no more than a 3-year period to enable affected shippers, communities and railroads to work out a means of making the branchline viable, securing service by alternative mode, or providing a local subsidy to assure continued service over the line. It is a means of assuring that essential service is preserved while also assuring that the Federal Government does not become a permanent financier of the railroad system. The branchline system must be pared down to the size that can be supported by available traffic.

TRANSPORTATION OF AGRICULTURAL PRODUCTS

Demand for motor carrier and water carrier services has grown substantially relative to the demand for railroad services. Nowhere has this trend been more obvious than in the area of agricultural movements. Where railroads once moved almost all agricultural commodities, they now have only a portion of the grain and barely 11 percent of the fresh fruit and vegetables.

The share of produce carried by railroads in the United States declined from 16.4 percent of the total movements in 1975 to 11.1 percent of the total in 1977. Even in Eastern cities, those generally furthest from the growing areas, most produce was carried by motor carrier. For example, only 18 percent of the produce moving from growing area to Boston arrived by rail. Only half of the produce moving cross-country from California to Boston, went by rail (3). It is clear that railroads no longer play a very large role in the movement of fresh produce, even on the longest hauls.

The railroads must offer an improved price-service package if they are to regain a significant share of the produce traffic. The railroads are trying to develop the technological and marketing means to compete effectively against motor carriers. If they can develop new technologies or new marketing techniques that would make them more competitive, shippers would benefit because of the resulting increase in intermodal competition. This, in turn, would lead to better service and lower rates as both competing carriers sought to attract new traffic.

Evidence on grain movements is more fragmentary, but available evidence suggests that there, too, trucks now move traffic once thought to be railcaptive.* Motor carriers carry more than two-thirds of the inbound grain, and motor carriers and barges together account for two-thirds of the outbound grain moving at Minneapolis-St. Paul. Between January and August of 1978 railroads carried 69,551,000 bushels of all grains into Minneapolis-St. Paul (including soybeans), and hauled out 65,839,000 bushels. During the same period, trucks hauled in 149,392,000 bushels into the twin cities and, together with barges, carried out 140,909,000 bushels. Thus, railroads accounted for only 30 percent of the grain brought into Minneapolis and 32 percent of the grain hauled out (7). The motor carrier and water carrier share of this market has been growing steadily over the last 10 years. In 1970, for example, motor carriers accounted for only half of the inbound grain at Minneapolis.

IMPEDIMENTS TO EFFICIENT OPERATIONS OF RAILROADS

There is no single explanation for why traffic has moved from railroads to other modes of carriage. Superior service at competitive rates doubtlessly accounts for a large portion of the shift from railroads to

*The Upper Great Plains Transportation Institute reports that in 1975-76, one-third of grain moving out of North Dakota moved by motor carrier (4). Another survey indicated that railroads carried only 14 percent of the soybeans and 19 percent of the wheat shipped out of Illinois in 1973 (5). A Southern Cooperative Series study suggested that in 1970, railroads moved 63 percent of the grain moving in interstate commerce from eight Southern States moved by rail (6). The trend has been to move more grain by truck and less by railroad. It is likely that the share of grain moving out of the eight Southern States is larger now than it was in 1970. It is clear that in the movement of grain, as in the movement of produce, there is a great deal of intermodal competition. In both instances, traffic carried by rail is now moving by motor carrier.

motor carriers. Lower rates resulting partly from the subsidized nature of waterways provide a good explanation for why much traffic that once moved by railroads now moves by water carrier. Regulatory and subsidy practices have also encouraged a shift from rail to motor and water carriers. Exempt motor carriers and water carriers have been able to adjust rates quickly to meet particular market conditions, however, a combination of management inertia and regulatory constraints have prevented railroads from adjusting rates expeditiously to compete effectively with trucks and barges.

Subsidies paid to modes that compete with rail may account for some of the shift from rail, as well. Many believe, for example, that motor carriers do not pay the full cost of the roads they use. To the extent that motor carrier user charges do not recover the full costs of that portion of the highway system consumed by heavy trucks, the trucks receive a subsidy. Such a subsidy would lower motor rates and cause some diversion from railroads. Several studies are underway to examine this issue, but the analytical problems are formidable and it will be a while before an accurate measure of what, if any, subsidy is received by motor carriers. Water carriers receive a substantial subsidy in the form of free use of waterways. This also results in reduced water carrier rates and diversion of traffic from railroads. Congress has just approved the imposition of waterway user charges to defray a portion of the cost of maintaining the waterways. Railroads, by contrast, have generally paid substantially all of their right-of-way costs. Today, some branchlines are subsidized, and some railroads have received low interest loans or grants to rehabilitate facilities and track.

THE GRAIN MARKET TODAY

Today, a substantial amount of grain moves by motor and water carrier for the entire journey. Almost all grain moves by motor carrier from farm to storage elevators from which it can be loaded onto railcars. Recently, however, we have seen a shift from small storage facilities located close to the farm and lying along a multitude of branchlines to a combination of onfarm storage and more centrally located, large capacity storage facilities. This shift in grain storage patterns has had three results. First, it has made necessary longer truck movements from farm to rail-served storage facility. Second, it has resulted in a greater quantity of grain being stored at a single location. This makes use of grain unit trains possible. Third, it has permitted farmers to store grain on the farm at harvest instead of having to move it immediately to small local storage facilities.

Recent Department of Agriculture data show that there is a total of 16.9 billion bushels of grain storage capacity in the country. Of this total, 9.9 billion bushels are onfarm storage and 7 billion bushels are stored in off-farm commercial facilities (8). Although comprehensive data were not collected prior to 1978, the general consensus is that the amount of onfarm storage has grown substantially in the past several years. The amount of grain stored onfarm suggests that farmers have become a major force in the grain futures market.*

*In 1976, grain stored on farms was as high as 5.3 billion bushels out of a total of 8.4 billion bushels stored. It rose to 5.1 billion bushels out of a total of 8.9 billion bushels stored in 1977, then to 6.2 billion bushels out of a total of 10.3 billion bushels stored in 1978 (9).

Farmers once thought of as being at the mercy of grain traders are now themselves grain traders. Onfarm storage gives the farmer the ability to hold his grain until prices rise rather than having to sell it at harvest or find a local commercial elevator in which to store it. Further, farmers can borrow against stored grain and either pay off the loan as grain prices rise and the grain is sold, or allow the lender to foreclose on the grain at the loan rate. If railroad rates could change with the same speed and frequency that motor and water carrier rates do, farmers could use their increased storage capacity to hold grain back when transport rates are high and ship when they fall.

From the point of view of the farmer, the large onfarm storage capacity suggests that even the relatively predictable peaks in transportation demand that once occurred at harvest time need no longer occur. Rather, market prices and foreign demand for grain can dictate when a peak in demand for transportation will occur. Since demand for grain for domestic use is relatively constant, it is changes in foreign demand that cause most of the price fluctuation. Except to the extent that he has an immediate buyer for his grain, a temporary delay in moving grain is of relatively little consequence for those farmers who have storage capacity.

Of course, a farmer may have chosen to put last year's harvest into storage onfarm hoping to sell it at a higher price later. If it is held long enough and a second crop is harvested, available storage may already have been exhausted and the farmer may have to ship the second crop at harvest. If a second crop comes in as grain prices rise, the transportation system may be called on to move 2 years of crop at once. Thus, fluctuations in transportation demand can become more pronounced depending on whether farmers choose to store most of a year's crop or to ship 2 year's crop at one time.*

THE MARKET FOR TRANSPORTATION OF GRAIN

Two factors must be considered in looking at the grain transportation market: demand for grain and demand for transportation. The two are not always coextensive nor do they affect the railroads the same way. Peak in demand for grain transportation cause transportation costs to rise. Trucks and barges respond by raising rates. Railroads are unable to adjust rates in response to such market-induced peak demand conditions and unable to reject the additional traffic when it is tendered. Motor carrier and barge rates are set either in conformity with contractual arrangements negotiated in advance of movement or on the basis of "spot rates" quoted when service is requested. Spot rates fluctuate in response to the quantity of service demanded and the supply of trucks or barges available to provide service.

With respect to demand for grain itself, we typically find that grain prices rise as foreign demand for U.S. grain increases. Grain located onfarm or at inland storage points which is sold to foreign

*Farmers have the opportunity to significantly improve earnings by grain trading. In 1972, wheat was selling for less than \$2 per bushel. By the end of the year, it had risen to something above \$2. By late 1973, it had risen above \$4 per bushel, and it pushed above \$5 a bushel in 1974. By May, it had dropped below \$4 and then it went back up in November. In June 1975, it reached another trough in the neighborhood of \$3 and then went back to \$4. From August, it fell to a low of around \$2 in June of 1977 (10). It has been rising since. The Department of Agriculture explains the variation in prices primarily in terms of variation in world grain harvest (11). Onfarm storage has allowed farmers to improve earnings by becoming grain traders.

buyers, moves to ports and is then carried by ship to its final destination. When a large foreign grain sale increases demand for movement, trucks and barges quote increased "spot" rates. Thus, both modes benefit from the higher grain price. To the extent that domestic grain consumption is predictable, long-term barge or truck contracts can be negotiated at fixed rates. Thus, shippers can count on an assured supply of and price for transport, unaffected by fluctuations in demand for transportation.

Railroads, however, are effectively prevented from raising rates in response to an increase in demand for transportation services. When demand for grain movements allow barge and truck carriers to increase their rates, railroads must carry whatever grain is tendered at a rate which may have been set months or years before. When demand for grain movements declines, again, railroad rates must remain as shown in the tariff, allowing barges and trucks to attract much of the traffic by posting lower rates.* Further, railroads are required to respond to changes in demand by supplying additional equipment with which to move the grain at the published rate. No similar obligation is imposed on barges or on trucks.

There is a very wide fluctuation in demand for rail movements of grain both over the year and from year to year. Variations in the level of weekly grain car loadings over the year are enormous.† And in some years, as much as 50 percent of capacity to move grain has either been idle or placed in other service as a result of low levels of demand for railroad transportation service.

There may be shortages of cars for months at a time when both storage and harvest grain is moving to market at the same time. At that point, backlogs of car orders occur and shippers complain about inadequate rail service. In the past 12 months, the problem of inadequate supplies of cars was made worse by regulatory constraints which required railroads to break up unit trains and use those cars in single car service. This benefited small shippers but aggravated car shortage problems and reduced substantially the amount of grain moved. There are gluts of cars during other periods when grain is either moving by motor carrier and barge at reduced rates or is not moving at all. Thus, it is not surprising that railroads are reluctant to invest in sufficient equipment to move grain without delay during the busiest periods of a peak. In normal years, such cars could only be used in grain service for a small part of the year.

The problem of peak period demand for rail transportation services should be dealt with in the same manner that fluctuations in demand for truck service, for barge service, and for the grain itself is handled. Railroads should be provided the opportunity to contract with shippers to move their grain at fixed rates. They should be permitted to

*As mentioned above, grain movements are not now predicated on the calendar because they are no longer tied to harvests. Thus, the calendar-determined peak and off-peak rates that are permitted the railroad are often worse than useless. The Burlington Northern, for example, reportedly moved much of the grain exported to the Soviet Union in 1973 at its off-peak rates.

†In the first quarter of 1976, weekly grain car loadings varied from a low of 21,646 cars to a high of 25,584 cars. In the second quarter, the variation ranged between 19,482 in the second week of the quarter and 31,649 in the last week of the quarter. During the third quarter, the loadings ranged from 24,163 cars to 32,724 loadings. In the fourth quarter, loadings ranged from 15,815 loadings to 31,172 loadings. Even in 1977, a relatively even year in terms of weekly car demand, loadings were as low as 16,879 cars and as high as 30,083 cars. In 1974, a year with substantial fluctuations in demand, grain loadings varied between 13,664 cars in one week, the 22d week of the year, and 36,233 cars in the 43d week (12).

adjust "spot rates" up or down, as demand for service increases or decreases over the year.

Contract rates would permit grain shippers and railroads to enter into a mutually binding agreement specifying when grain was to be moved, that it was to be moved by rail and the price at which it was to be moved. Contracts could even be drafted which left both the date of delivery and the destination open and set the rate on the basis of some formula. Such contract rates would assure shippers the rate they would have to pay when the grain moved. In exchange, railroads would receive assurance that the grain would move by rail. On the basis of such contracts, railroads could purchase appropriate equipment, knowing that the business needed to pay for the equipment would be forthcoming.

Shipments not moving under contract rates should be subject to rates set by the railroads in response to particular market conditions and subject to availability of equipment after contractual obligations to move grain were discharged. The Interstate Commerce Commission can permit establishment of such rates under the peak and seasonal rates provision of the Interstate Commerce Act. We believe this authority can be used to give railroads latitude to adjust rates at management discretion in response to varying demand conditions. Shippers choosing to minimize transportation costs could negotiate specific transportation contracts for services during periods when the railroad expected idle capacity or enter into a contract which permitted a railroad to move grain at its own convenience. Alternatively, a shipper could simply wait until rates fell to low levels before moving the grain.

Farmers with both onfarm storage and access to storage at ports could minimize transportation cost by moving grain when rates were at their lowest level. Shippers anxious to hold grain until grain prices increased, usually during periods of peak demand, would have to pay higher rates. Such a process would provide a pecuniary incentive for railroads to keep extra cars for peak periods. It would also provide pecuniary incentives for some shippers to use their storage capacity to time their grain movements to minimize transportation costs (and incidentally, to reduce the size of the peak). Not all farmers will take advantage of offpeak rates. Some shippers who, in the absence of peak rates, would have shipped at the peak will rearrange their operations to take advantage of savings available to those who ship during off-peak periods. Others, those who value movement of grain during peak periods most highly, will simply pay the higher rates and continue to ship during the peak period.

Such a system would remove the inequity associated with holding rail rates to published levels while barge rates, truck rates and the price of grain itself continue to fluctuate. It would also increase the efficiency of the entire grain transportation system. The ability of unregulated barges and trucks to aggravate fluctuations in demand for rail service by setting rates below rail rates at some times and pricing themselves out of the market at other times would be eliminated. Indeed, the ability of railroads to match price changes posted by competing modes would, by itself and without any temporal shift in grain shipping patterns at all, reduce the variations in quantities of grain carried by railroads.

TRANSPORTATION OF FRESH FRUITS AND VEGETABLES

Railroads carry only a small part of the annual movement of fruit and vegetables. In the produce market, unregulated motor carriers have been very successful in attracting most of the traffic that was once captive to the railroads. In this market too, motor carriers are known for their ability to adjust rates quickly in response to changing market conditions. Truck produce rates are usually quoted orally, and therefore published reference to such rates is hard to find. However, there have been reports of changes in rates of as much as 45 percent in 1 month on truckloads of produce moving from the west coast to the east.

The superior quality of service offered by the motor carrier is probably as important in attracting traffic as are competitive rates. Railroads providing service in conventional refrigerated boxcars simply have not provided the quality of service offered by motor carriers. A number of experiments are underway to attempt to reduce the quality of service differential. Virtually all of the experiments depend on trailer on flat car (TOFC) technology. Using this technology, agricultural products are gathered by truck. The trailers are placed on flat cars and hauled to a distribution point from which they are delivered again by motor carrier.

At least in theory, this should allow for rapid assembly of substantial amounts of produce which can then be moved expeditiously to markets, thereby narrowing the quality of service differential between motor carrier and rail movement of produce. TOFC service will not by itself, however, eliminate the competitive advantage enjoyed by motor carriers, since motor carriers can change the rate charged at will, secure in the knowledge that railroads cannot match such changes.

As DOT argued in recent comments on the Interstate Commerce Commission's proposed policy statement on contract rates, railroads should be permitted to enter into a contract to provide service at some future date at a particular rate in exchange for the shipper committing to ship by railroad. When a railroad is asked to provide service absent such a contractual agreement, railroads should be permitted, without any regulatory constraint to set a rate appropriate to prevailing demand and competitive conditions. Since railroads now have such a small portion of the produce market, almost the only use to which such pricing freedom could be put would be to try to regain a portion of the market they have lost. It is not clear whether TOFC technology coupled with increased pricing freedom will improve the railroad's share of the produce market. It is apparent, however, that the big beneficiaries of any railroad attempt to reenter the market will be the shippers who will reap the benefits of increased intermodal competition and better service. Such competition can result in lower average rates, improved levels of service, or both.

In the Interstate Commerce Commission's recent advanced notice of proposed rulemaking on how to use the general exemption authority granted by the Railroad Revitalization and Regulatory Reform Act of 1976, there was broad support for granting railroads complete rail rate flexibility on produce movements. Not only the railroads, but also the U.S. Department of Agriculture and many produce shippers

supported the concept. The prognosis for improved transportation service for the movement of produce, once railroads secure the right to offer contract rates and to adjust their rates rapidly in response to market demand conditions, is excellent.

CONCLUSION

Greater reliance on the market and fewer regulatory constraints on operation will benefit both shippers and carriers. Unregulated motor carriers of agricultural products should not have to depend on certificated carriers to secure traffic to carry on their return trips. Railroads should not be prohibited from rapidly adjusting prices to compete with carriers who can provide the same services railroads offer. Much of the strength of our transportation system results from carriers and shippers responding to changing market conditions. A substantial portion of the transportation problems facing us today are a result of regulatory constraints inhibiting other needed adjustments. Most often, the best regulation is provided by allowing market forces to allocate resources rather than by interfering with those market forces. DOT believes that increased operating flexibility for motor carriers of agricultural commodities and increased pricing flexibility for railroads would greatly improve the functioning of the transportation marketplace.

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INDUSTRY VIEW OF TRANSPORTATION AND STORAGE OUTLOOK

(By Paul Stepmner, vice president, transportation, the Pillsbury Co.; Transportation Committee, National Grain and Feed Association)

It has been frequently stated that the United States has the best agricultural system in the world. A key component of this sophisticated agricultural system is our transportation system that is also considered to be the world's best. My discussion today attempts to forecast how well the transportation demand of our grain industry can be met by the various transportation modes. Specifically, I will discuss the following points:

- (1) Railcar supply and demand;
- (2) Grain transportation rates—industry perspective on rate levels;
- (3) Problems and solutions in meeting demand;
- (4) Regulatory issues, and
- (5) National Grain and Feed Association position.

RAILCAR SUPPLY HISTORY

Generally, when transportation supply is referred to, railcar supply comes to mind. However, one must also consider rail service as measured by turnaround time as important as the number of cars in the rail fleet. When attempting to forecast the adequacy of the Nation's car supply, one should first look at the history of car supply and the demand for grain transportation. Basically, two types of cars are used for grain service; the covered hopper car and 40-foot boxcar. Open top cars have been used during severe car shortages to a limited degree.

Table 1 shows a history of the 40-foot box and covered hopper car since 1960.

TABLE 1.—RAIL BOXCAR AND HOPPER SUPPLY, 1960-78

	All plain 40-ft boxcars ¹	Percent decrease	All covered hoppers ¹	Percent increase	Railroad hoppers	Percent increase	Private hoppers ¹	Percent increase
1960.....	563,470	4.0	61,407	-----	61,407	-----	-----	-----
1961.....	541,563	4.0	72,574	18.0	63,910	4.0	8,664	-----
1962.....	508,468	6.5	75,510	4.0	65,688	3.0	9,822	13.5
1963.....	477,773	6.5	80,028	6.0	69,016	5.0	11,012	12.0
1964.....	444,217	7.5	85,651	7.0	73,823	7.0	11,828	7.5
1965.....	404,663	10.0	102,570	20.0	87,889	19.0	14,681	24.0
1966.....	368,932	9.5	109,639	7.0	92,080	5.0	17,559	19.5
1967.....	343,739	7.5	129,393	18.0	105,027	14.0	24,366	39.0
1968.....	319,449	7.5	147,060	13.5	118,960	13.5	28,100	15.5
1969.....	295,933	8.0	153,018	4.0	122,566	3.0	30,205	7.5
1970.....	272,370	8.5	160,319	5.0	125,867	2.5	34,452	14.0
1971.....	250,251	9.0	169,926	6.0	130,954	4.0	38,972	13.0
1972.....	229,928	9.0	179,144	5.5	138,099	5.5	41,045	5.5
1973.....	206,959	11.0	186,219	4.0	142,309	3.0	43,910	7.0
1974.....	189,539	8.4	204,270	9.7	150,499	5.8	53,771	22.5
1975.....	176,933	6.7	219,362	7.4	155,281	3.2	64,081	19.2
1976.....	155,522	12.1	226,459	3.2	157,034	1.1	69,425	8.3
1977.....	134,771	13.3	230,069	1.6	159,924	1.8	70,145	1.0
1978.....	107,976	19.9	235,975	2.6	162,672	1.7	73,303	4.5

¹ All figures as of Jan. 1 of each year.

As shown, the 40-foot car is on its way to extinction, being reduced from 563,470 cars in 1960 to 107,976 cars in 1978. Covered hopper cars, on the other hand, have increased from 61,407 to 235,975 cars during the same time period. If one assumes that the carrying capacity for the 40-foot boxcar is 110,000 pounds and 200,000 pounds for the covered hopper car, the total carrying capacity for cars suitable for grain service has actually decreased. However, one must also consider that the covered hopper car is used for a great variety of commodities and the demand for those cars has also increased. The importance of the covered hopper car for grain use is shown by the fact that the percentage of all rail grain moved in covered hoppers increased from 54 percent in 1970 to 88 percent in 1977.

As previously mentioned, turnaround time is an important consideration in car supply. In the years of 1972 through 1974, rail carriers were averaging approximately 16.5 trips per year in boxcars and 17.6 trips per year in covered hoppers. In 1977, plain boxcars averaged only 12.2 trips per year and covered hoppers averaged 15.2 trips per year. Service is related to many factors. Most carriers have experienced severe power shortages where movement of trains have been delayed. Slow orders due to conditions of track, as well as adverse weather conditions, have hampered the carriers ability to improve service.

Table 2 shows daily average supply of grain cars 1977 versus 1978 through July 1. The car shortages have increased significantly.

TABLE 2.—DAILY AVERAGE SUPPLY OF GRAIN CARS—1978, SURPLUS OR SHORTAGE (—)

Week ending	1978		1977—Comparable week	
	Boxcar	Covered hopper	Boxcar	Covered hopper.
January:				
7.....	-1,179	-7,697	11,695	2,641
14.....	-1,524	-7,274	10,700	-835
21.....	-1,556	-9,881	7,980	-3,624
28.....	-2,029	-11,829	3,715	-7,291
February:				
4.....	-2,655	-14,246	1,433	-9,666
11.....	-3,203	-15,752	-1,043	-12,140
18.....	-4,448	-20,244	-1,722	-11,957
25.....	-4,401	-20,980	-2,213	-10,050
March:				
4.....	-4,971	-26,679	-2,924	-11,433
11.....	-5,298	-27,577	-2,479	-11,381
18.....	-5,596	-29,171	-1,550	-10,839
25.....	-5,610	-30,125	-1,042	-9,246
April:				
1.....	-5,813	-33,546	-1,028	-8,321
8.....	-5,927	-33,682	-817	-7,396
15.....	-5,959	-37,182	-301	-6,994
22.....	-5,328	-37,080	1,018	-5,921
29.....	-5,978	-32,545	1,445	-4,478
May:				
6.....	-6,384	-31,991	3,946	-996
13.....	-6,397	-31,283	5,284	627
20.....	-5,513	-28,343	5,940	1,955
27.....	-5,349	-28,322	7,811	2,577
June:				
3.....	-5,907	-25,906	8,448	4,002
10.....	-5,078	-27,260	8,238	2,020
17.....	-5,256	-26,609	8,595	386
24.....	-4,636	-23,840	8,302	705
July: 1.....	-4,037	-20,202	7,912	1,486

DEMAND FORECAST

U.S. grain production has increased from over 180 million metric tons in 1965 to an estimated 260.6 million metric tons for the 1977/78 crop year. Projections for 1978/79 crop year is a further increase to 262.7 million metric tons. For the same periods, exports have increased from slightly over 50 million metric tons to an estimated 88 million metric tons in 1977/78 crop year and a projected 85 million metric tons in 1978/79 crop year. It is estimated that rail and barge shipments to export outlets each account for 40 to 45 percent with the balance moving by truck. Ice conditions on the upper rivers and the ability to avoid delays through lock and dam 26 will also have a significant bearing on rail car demand. The world grain situation has also changed drastically with continued dramatic increases in consumption.

TRANSPORTATION SUPPLY VERSUS DEMAND

In reviewing the car supply history, service availability, current status as to car shortages and grain production, one must conclude that the 1978-79 crop year will be extremely difficult from the standpoint of transportation supply. While car and locomotive orders are at a high level, car and locomotive building capacity restrictions do not permit overnight solutions to the problem. As far as barges are concerned, it is estimated that there are 25,000 to 26,000 dry cargo barges (29 to 30 million short tons) which represents an increase of 1,500 barges over last year.

GRAIN TRANSPORTATION RATES—INDUSTRY PERSPECTIVE ON RATE LEVELS

The rail carriers are seeking a 10-percent increase on grain and grain products, 13 percent when rates permit transit in the South and 13 percent on export between eastern and southern territories. Carriers want an effective date of December 15, 1978. In addition, we expect that the rail carriers will be asking for an additional increase in 1979 of about 6 percent. Barge freight from upper Mississippi ports to the gulf for export was being quoted at 280 percent over the common carrier basis. The rate history showing grain rates from Minneapolis and Kansas City is rather revealing. In 1938, the rate from Minneapolis to Chicago was 13 cents a cwt. and in December 1946, it was still 13 cents. From 1970 to 1978 the rate almost doubled from 30½ cwt. to 60½ cwt., which of course, exceeded the rate of inflation. The attached rate history (table 3) may be of some interest. I anticipate that rail freight rate increases will continue to exceed the average inflation rate.

TABLE 3.—HISTORY OF GRAIN RATES TO CHICAGO, ILL.

Date of change	From Minneapolis	From Kansas City
Mar. 27, 1938.....	12.0	15.0
Mar. 23, 1938.....	13.0	16.0 X-123 (5 percent).
Mar. 16 1942.....	13.5	16.5 X-148 (3 percent).
May 13, 1943.....	13.0	16.0 X-148 cancelled.
July 1, 1946.....	13.5	16.5 X-148 reinstated.
Dec. 31, 1946.....	13.0	16.0 X-148 cancelled.
Jan. 1, 1947.....	15.0	18.5 X-162 (15 percent over X-123).
Oct. 13, 1947.....	17.0	20.0 X-166 (10 percent EC).
Jan. 15, 1948.....	18.0	23.0 X-166 (20 percent EC).
May 6, 1948.....	19.0	23.0 X-166A (25 percent over X-162).
May 13, 1948.....	19.0	22.5 Sup to WTL 332-C.
Jan. 11, 1949.....	20.0	23.6 X-168 (5 percent EC).
Sept. 1, 1949.....	20.5	24.5 X-168A (9 percent over X-166A).
Apr. 4, 1951.....	20.9	25.0 X-175 (2 percent EC).
Sept. 12, 1951.....	21.7	26.0 X-175A (6 percent EC over X-168A).
May 17, 1952.....	23.0	27.4 X-175B (12 percent EC over X-168A).
Dec. 1, 1955.....	23.0	27.5 X-175C (12 percent over X-168A).
Mar. 7, 1956.....	24.0	29.0 X-196 (5 percent).
Dec. 29, 1956.....	25.0	30.5 X-206 (5 percent).
Aug. 26, 1957.....	26.0	31.5 X-206A (5 percent over X-196).
Feb. 15, 1958.....	27.0	32.5 X-212 (3 percent).
Oct. 24, 1960.....	27.5	33.0 X-223 (½ cent specific).
Aug. 19, 1967.....	27.5	33.0 X-256 (1 cent NE 30¢, 2¢ NE 80¢) flagged out in WTL 332.
June 24, 1967.....	27.5	34.0 X-259-A (3 percent).
July 28, 1968.....	27.5	33.0 X-259A flagged out in WTL 332.
Nov. 28, 1968.....	27.5	33.0 X-259B (6 percent). flagged out in WTL 332.
Nov. 13, 1969.....	29.0	35.0 X-262 (6 percent).
June 9, 1970.....	30.5	37.0 X-265A (5 percent) table 2.
Sept. 13, 1970.....	30.5	36.5 X-262 5 percent table 6 on Gr. & Gr. Prod. between West & Border.
Nov. 20, 1970.....	30.5	36.5 X-265-B 5 percent increased to 6 percent.
Do.....	33.0	39.5 X-267-A 8 percent east and west; 6 percent south.
Apr. 12, 1971.....	30.5	36.5 X-265-B combined X-262 and X-265-B in west on Gr. & Gr. Prod., 11 percent table-11G.
Do.....	34.0	40.5 X-267-B 11 percent east and west, table-11G.
Feb. 15, 1972.....	34.9	41.5 X-281 (2½ percent EC).
Oct. 23, 1972.....	35.0	41.5 X-281-B (3 percent over X-267-B) table 3G.
Mar. 19, 1973.....	36.0	42.5 X-295-A (3 percent over X-281-B) table 3G.
Oct. 1, 1973.....	37.0	43.0 X-299 (1.9 percent over X-295-A).
Jan. 1, 1974.....	37.0	44.0 X-299 (2.6 percent over X-295-A basis).
Jan. 31, 1974.....	37.8	44.9 X-301 (2.1 percent surcharge on X-299) 2.1 percent on total freight charges accruing to a rail shipment.
Mar. 9, 1974.....	38.5	45.5 X-303-A (4 percent over X-299 level).
Do.....	39.5	46.6 X-301-A (2.5 percent fuel surcharge on X-303A level—cancels X-301).
Mar. 16, 1974.....	39.5	46.6 X-299-A (2.8 percent on X-295-A level).
Apr. 1, 1974.....	39.6	46.8 X-301-B (2.8 percent fuel surcharge).
May 1, 1974.....	39.7	46.9 X-301-C (3 percent fuel surcharge, cancels X-301-3).
June 1, 1974.....	39.8	47.0 X-301-D (3.3 percent fuel surcharge, cancels X-301-C).
June 5, 1974.....	40.8	49.1 X-305 (3 percent over X-303-A level).
June 20, 1974.....	44.0	52.5 X-305-A (3.3 percent plus 10 percent on X-303A level).
Apr. 27, 1975.....	47.0	56.0 X-310-A (7 percent on X-305A level).
June 20, 1975.....	49.5	59.0 X-313 (5 percent over X-310-A).
Oct. 11, 1975.....	50.5	60.5 X-313 (2½ percent over X-313 June 20).
Mar. 21, 1976.....	50.5	60.5 X-318 (7 percent over X-313 Oct. 11)—flagged out in west.
Oct. 7, 1976.....	53.0	63.5 X-330 (5 percent over X-313 in the west—includes 7 percent in east under X-318).
Jan. 7, 1977.....	55.0	66.0 X-336 (4 percent over X-330).
Nov. 30, 1977.....	58.0	69.5 X-343 (5 percent over X-336).
June 17, 1978.....	60.5	72.5 X-349 (4 percent over X-343).

Predictability, as far as grain rates are concerned, is extremely difficult. Each railroad has its own ideas as to what rate concepts are required to meet its competition. The following examples show some of these different concepts.

Railroad	Movement	Rate concept
Chessie.....	North Atlantic ports for export.....	65 cars—5 and 8 turns. 10 cars—5 cars.
ConRail and N. & W.....	North Atlantic ports for export.....	100 cars—5-20-30-35-45 turns. 10 cars—5 cars.
Southern and family lines.....	Grain to South.....	3 cars.
	Grain to South for export.....	3-5-10-65 cars.
ICG.....	Gulf ports for export.....	3-5 cars—50-60-75-100. 115 and 118 cars with guaranteed annual volumes.
CRIP-CNW.....	Gulf ports for export.....	25-50-75 cars—5 turns.
Soo Line and BN.....	Gathering rates to market.....	Single cars.
	Rates beyond primary markets.....	Single or multiple car rates.
UP.....	West coast domestic.....	5-25-50 cars.
	West coast export.....	25 and 75 cars.
ATSF.....	West coast domestic.....	5 car rates. 100,000 tons GAV. 150,000 tons GAV.
Milw.....	West coast domestic.....	5 cars.
	West coast export.....	5-15 cars. 25-50 cars, 5 turns.

I believe that it's fair to say that these concepts are based on a variety of circumstances. Truck competition, in some territories, lake or river in others, and in some cases, a combination of both. Market competition comes into play as well. Some carriers have published seasonal rates as well as separate rates for private cars with and without mileage allowances.

PROBLEMS IN MEETING DEMAND, SOLUTIONS IN TRANSPORTATION OF GRAIN

Basically, I'm sure we are all aware of the problems in meeting the demands for grain transportation. There are so many factors which control the carriers ability to meet the demand that a paper could be written on each. We, of course, can suggest solutions; however, if we really had a good total solution package, the value would be priceless.

First, I believe it would be fair to say that in the nonregulated fields of grain transportation, market forces will solve most problems. The nonregulated aspects of truck and water transportation, tied in with freedom of entry, makes transportation problems in these areas relatively small when compared to the rail problem.

For example, any individual can purchase a truck and transport grain on established highways. If industry does not like the price it can purchase its own trucks. Barges are much the same but of a more limited degree due to larger investment requirements. However, there are grain movements which cannot move by water due to geography and cannot move competitively by truck. This grain must move by rail, if it is to move competitively. Obviously, in this situation, industry does not have the luxury of freedom of rail entry. It is in this area that the industry needs a viable rail transportation system.

The first question that comes to mind then, is how does this country develop this viable rail transportation system which can offer required equipment and service at an affordable cost, in a timely fashion, and at a reasonable profit to the carriers? Also, this rail transportation system must, if at all possible, remain in the private sector. The problems are not insurmountable.

The railroads are both a capital and labor intensive industry. I have no pat solutions to offer as far as reduced labor costs are involved, however, the rail carriers have actually discouraged private investment in rail equipment. The cost of new covered hopper cars has risen very dramatically. The following shows the approximate costs for covered hoppers over the past 4 years:

	<i>Hopper car costs</i>
1975-----	\$27, 000
1976-----	28, 400
1977-----	29, 850
1978-----	36, 300

For years, the rail carriers have resisted the establishment of adequate mileage allowance for private cars. It has taken the threat of litigation through the ICC complaint process to have the carriers agree to a reasonable level of mileage allowances with procedures for updating these allowances on a periodic basis. The fact remains that a railroad will pay another railroad significantly higher car rentals than is paid to shippers. I'm unable to understand the rationale behind this arrangement.

In addition, rail carriers are not required to accept private cars. Rail carriers have established a so-called OT-5 procedure which requires the car owners to obtain permission from each railroad for use of each specific car at specific loading points. Some carriers have insisted on conditional OT-5 approvals, that is, agreements limited in time and at limited origins. Certain carriers have, at times, refused OT-5 approval completely. Certainly the grain shipper is reluctant to invest in rail equipment where mileage compensation is inadequate and with the risk of not being able to use the cars for their lifetimes. Some better arrangements need to be made.

I am also uneasy about the sensitivity of railroad management to the shipper requirements for adequate service. Certainly with increasing car costs, the advantages for the expeditious handling of cars should be obvious to the carriers. However, as long as we have a system whereby rail carriers compensate shippers on a per mile basis, there is little incentive for a more rapid movement of private cars. The ICC has already ruled against a reverse demurrage concept but again some method must be found to encourage carriers movement of private cars.

REGULATORY ISSUES

There has been much said and written on the issue of regulation, deregulation, and reregulation. There are those, both in the transportation industry and in the industrial world, who would argue that the railroad ills can be laid at the door of the regulators. Certainly, the present system of regulation and Government involvement in rail industry affairs has not resulted in a smashing success. One thing is certain. There are no industries in these United States that are not regulated, to some degree. When one considers the impact of regulation through the Robinson-Patman Act and the Sherman and Clayton Anti-Trust Acts, one finds that price fixing and discrimination becomes a rather nasty word. I don't believe that those who advocate the abolishment of the ICC, for example, can reasonably expect to maintain 5-B immunity and be free from regulation which is related to preference, prejudice, and/or discrimination.

I have yet to find the individual who feels that recent changes adopted by the 4-R Act have significantly helped the plight of the railroads or created a better transportation environment for the shipping public. It is rather interesting to note that the Department of Transportation released a report on October 10 which blames Government policies for the decline of the railroad industry. In this report, the DOT recommended a number of changes, including a cut-back in Interstate Commerce Commission regulation and to exempt the railroads from regulation where other forms of transportation are not regulated. As to the issue of exempting railroads from regulation on grain, it's my personal opinion that this should be done providing safeguards are established similar to those in the Robinson-Patman and Sherman and Clayton Anti-Trust Acts.

If the changes recommended by the DOT are adopted, I'm sure that it will take a considerable length of time since legislative action will be required. We still live in today's regulatory climate and hope that the decisions of the regulators are effective.

Some important issues are before the ICC at the present time which will have a dramatic effect on railroad operations. I'll mention just a few:

1. The Southern Pacific application for exemption from regulation on grain and other commodities which are presently exempt by motor carrier or water.
2. Mileage compensation and OT-5 requirements.
3. Contract rates.

In addition, there are numerous service orders which, I believe, are either counterproductive or not effective or one-sided. Specifically, I refer to service order 1332 which gives carriers 60 hours for car movements; on the other hand, service order 1315 establishes penalty demurrage by increasing demurrage charges and reducing free time. The key to car detention by shippers still relates to a great degree to service reliability. While the Commission recently rejected the concept of reverse demurrage, and increased the time allowed for movement of cars, it still places the burden of excellence on the shipper and receiver with penalties if it fails to meet the loading and unloading criteria.

Of greater concern was the publication service order 1304 which restricted the number of cars that railroads can have in unit-train service to 20 percent of ownership and the number of consecutive trips that each unit can make. There is no question that the unit-train is the most efficient way the railroads can move grain. It's difficult to understand how this service order can benefit the majority of shippers. Where unit-train shipments of grain are made, movements to the shipping point are generally accomplished by truck. When elevators capable of shipping unit-trains are closed due to lack of cars, movements to these elevators are frequently stopped. It would appear that overall more grain can be moved for more people by maximizing the unit-train utility. The ICC recently discontinued this order and they are to be congratulated for doing so.

PREDICTABILITY

One of the major problems in grain transportation is the lack of predictability. This includes rulings from regulatory agencies as well as rail carrier actions. It is extremely difficult to determine where to locate an elevator, for example. Not only do rate concepts change as

far as individual carriers are concerned, but the question of line abandonments and mergers is troublesome. The predictability of regulatory actions is also difficult. The results of this atmosphere of unpredictability would seem to hurt the rail industry, particularly the poorer or marginal railroads. When locating a new facility, the shipper's objective is to locate at points with accessibility to rail, barge, and truck transportation. Accessibility to barge transportation does not necessarily mean locating on water but also the ability to feed water facilities by truck. The question of unpredictability also encourages locations on strong railroads rather than on those who are marginal from an earnings standpoint or are susceptible to merger.

In concluding my comments it might be appropriate to state some excerpts of National Grain and Feed Association's transportation policy. In some respects, these could also be stated as objectives. Accomplishing these objectives would help in establishing a viable transportation system which is necessary for the grain and feed industry to continue as an important segment of the American economy:

1. We support the concept of a privately operated railroad industry, financed by private capital. In the event that conventional private financing is not possible, Federal assistance to the railroad industry should be made available, where necessary in the public interest to those facilities, in the following priorities: (1) Guaranteed loans; (2) direct loans; (3) direct grants, without Government participation in the maintenance and operation of such facilities; and (4) Government participation in ownership and maintenance, but not operation, of such facilities.

2. To encourage the infusion of capital to increase car supply and motive power, we support:

- A. The payment of compensation by railroads for the use of private freight equipment based on the costs of ownership of such equipment.

- B. The construction of new cars and motive power and the rebuilding of old cars and motive power in the following priority: (1) Adjustment of car compensation rates to include the cost of any significant repair or rehabilitation; (2) tax incentives in the forms of investment credit and accelerated depreciation; (3) low interest loans with or without guaranty features; and (4) a federally funded corporation to construct or repair and lease freight equipment that remain in short supply despite all efforts to encourage such construction and rebuilding.

- C. The unconditional acceptance by railroads of private cars for operating under applicable compensation rules.

3. We continue to support efforts to obtain the establishment of service criteria or performance standards with sufficient economic incentive to create the probability of general improvement in rail service.

4. We support the conference system of ratemaking (rate bureaus) which permits orderly discussion of transportation pricing and service issues between shippers and carriers, provided adequate safeguards are maintained to prevent abuse of any antitrust immunity granted to the carriers for the purpose of conducting joint consideration of pricing issues.

5. We do not oppose the concept of contract rates for the rail transportation of grain or grain products, provided other safeguards in part 1 of the Interstate Commerce Act are continued.

6. We support retention of the Interstate Commerce Commission as a separate administrative agency. We support the exclusive retention by the Interstate Commerce Commission of the adjudicatory and rulemaking powers and functions presently vested in that agency.

CONCLUSION

We will continue to experience severe transportation shortages during 1978 and 1979 via all modes of transportation. Rail service improvements must be accomplished if the car supply problem is to be eliminated. The grain industry can make a significant contribution to the covered hopper car supply by rail carrier encouragements in increased mileage allowances and better OT-5 arrangements. Future regulatory climate will have an important impact on the ability of our transportation industry to adequately serve the agricultural system in this country.

FARM INCOME OUTLOOK

(By Steven Guebert, Farm Income Project Leader, and David Dyer, Outlook and Situation Coordinator (NEAD), Economics, Statistics, and Cooperatives Service, USDA)

FARM INCOME OUTLOOK

Farm income has been strong in 1978 and this strength will likely continue into 1979. Improvements resulted from higher product prices and expanded markets for agricultural goods, both in the United States and abroad. Gross income, increasing by \$14 billion this year, should amount to \$122 billion. However, some of the greater receipts have been siphoned off by 9 percent higher production expenses. Production expenses will probably total \$96 billion in 1978, leaving net farm income near \$26 billion.

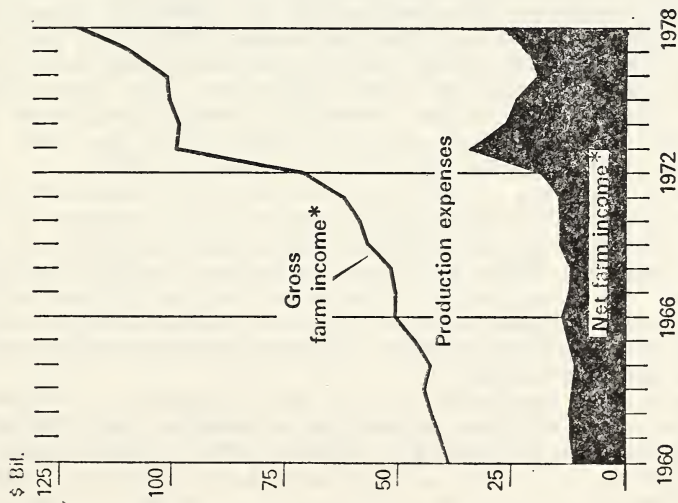
In 1979, gross income is likely to be in the \$125 to \$135 billion range. Higher cash receipts, along with increased nonmoney income will offset higher production expenses, that will rise \$5 to \$10 billion, leaving net farm income near the 1978 level. Domestic and foreign supply and demand uncertainties result in a net farm income forecast range of \$23 to \$29 billion for 1979.

REVIEW OF INCOME SITUATION

The higher gross farm income this year will result in the first significant upturn in real net earnings in 5 years. Gross income, including inventory adjustments, was near the \$100 billion mark from 1973 through 1976. Last year there was nearly a \$7 billion gain in gross income after adjustment (figure 1). But persistent rises in production expenses, coupled with general price increases that plagued all consumers, sharply reduced farm operators' purchasing power from the record high of 1973. Thus, net farm income in 1967 dollars declined each year from 1973 into 1977, both in aggregate and on a per farm basis (figure 2).

By 1976 and during much of 1977, farm operators faced a difficult cash flow and net returns situation. The acuteness of the problem varied greatly by producer groups and regionally. Problems were lessened by: (1) The ability of some farmers to draw on financial assets built up during 1972-74; (2) strong equity positions which permitted increased farmer borrowing and allowed refinancing of existing debts; and (3) the large amount of nonfarm income received by many farm operator families. The most hard pressed operators were frequently new entrants to farming and those with little equity and reserve borrowing power, especially such operators who also had low off-farm earnings.

FARMERS GROSS MORE, BUT EXPENSES ALSO RISING



* Includes change in farm inventories.

Figure 1

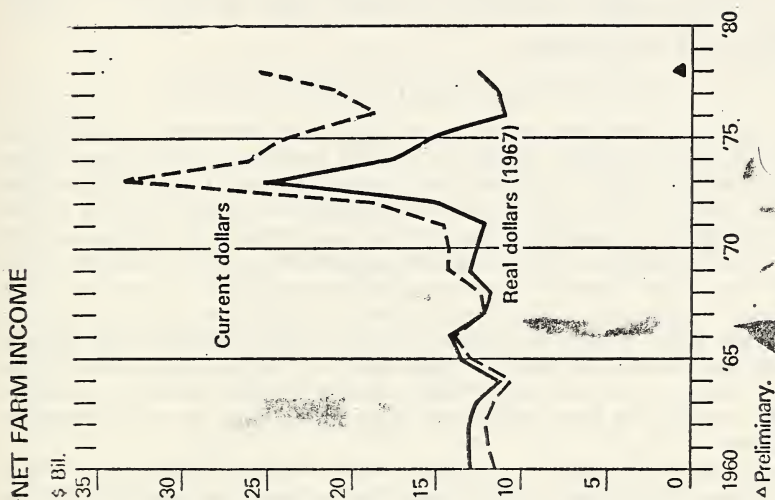


Figure 2

Off-farm earnings have increased steadily for the last two decades and are again up in 1978, to around \$33 billion. Prospects are for continued increases in 1979. However, current information on off-farm earnings is less detailed than we would like, given its importance. Estimates, based on the census of agriculture, show such income to be concentrated among the smaller value-of-sales classes and in more industrialized areas of the country. Thus, not all operators benefit equally from such income.

OUTLOOK FOR MAJOR INCOME COMPONENTS

The major strength in receipts this year and next stems from livestock and livestock products. These receipts will increase from \$47.6 billion in 1977 to \$58 billion this year and to the \$60-\$65 billion range for 1979. The cattle cycle has reduced red meat supplies in the face of strong consumer demand this year. Total production of red meat and poultry in 1979 will about match this year's level and prices of livestock and livestock products could strengthen further.

Total crop receipts from marketings in 1978 have gained modestly from the \$48.5 billion recorded for 1977. While receipts from major grains and cotton will decline from last year, higher receipts for soybeans, tobacco, and fruits and vegetables will bring total crop receipts to \$51 billion. In 1979, total crop receipts as high as \$55 billion are realistic.

Including Government payments, total receipts of grain producers in 1978 could equal last year's levels. Government payments of \$2.5 to \$3 billion are likely in 1978, compared to \$1.8 billion in 1977. In 1979, payments of \$2 to \$3 billion are anticipated.

As with receipts, much of the gain in production expenses is associated with livestock. Increased feeding will raise feed expenditures about 5 percent both this year and during 1979. Feed purchases, totaling \$13.8 billion during 1977, are expected near \$14.5 billion this year and may amount to \$15 billion next year. Due to much higher feeder animal prices, livestock purchases will show large percentage and dollar increases—from \$6.7 billion last year to \$9 billion in 1978. A much smaller rise is expected in 1979.

Interest payments for production and mortgage loans are up more than 10 percent in 1978. Similar increases can be foreseen for 1979. Thus, total interest charges will amount to nearly \$10 billion in 1978 and at least \$11 billion next year. In coming months, expenditure increases will be required to maintain and enlarge the stock of farm equipment and expand facilities. The stronger livestock sector will be the source of particularly heavy capital expenditures, including outlays for breeding animals.

Greater total investment in plant and equipment and higher replacement costs will push depreciation allowances above \$17 billion in 1978 and to a projected \$19 billion in 1979. In recent years, net investment in farm plant and equipment has exceeded the depreciation allowance.

Real estate and personal property taxes have risen steadily, primarily because of higher assessed values. Such taxes, which amounted to \$3.8 billion in 1977, could approach \$5 billion by next year.

Government programs reduced 1978 acreage in major field crops and resulted in smaller crop production outlays for such items as fertilizer and fuel. Fertilizer prices and quantities are both down in

1978, but are expected to rebound somewhat in 1979. Fertilizer expenses have been and will remain around \$6 billion annually. Pesticide expenses are also holding steady near \$2 billion annually. Price pressures on energy will maintain fuel expenses at current or higher levels in the near future. Fuel expenses amount to some \$4 billion annually.

CASH RECEIPTS BY MAJOR PRODUCER GROUPS

In 1978, total physical marketings and marketing receipts will fall below those in 1977 for nearly all grains. Adding direct Government payments, cash receipts for the feed grains in calendar 1978 will probably edge above those of last year. However, food grain receipts will remain below those in 1977—even after accounting for Government payments. The lower food grain receipts can be explained by shifts in marketing patterns and changes in net CCC loan activity during recent crop years. CCC loans are treated as cash receipts in the income accounts. During the last half of 1977, net loan placements were extremely large; considerably less loan activity is occurring this year.

Another interesting comparison is that which results from adjusting the cash receipts for the major crops by the value of the physical change in producers' inventories. Because sales in a calendar year originate from 2 crop years, such an adjustment provides a clearer picture of earnings from the current year's crop. In the case of feed grains, the adjusted series shows a greater increase than the receipts alone indicate. For wheat, adjusting for the value of the inventory change still leaves receipts lower in 1978 than in 1977.

Cash receipts from soybeans may be as much as \$3 billion higher than last year. After adjusting for inventory changes, the improvement is less dramatic, but 1978 is still a record year for soybeans. Relatively low prices late in 1977 caused producers to carry over an unusually large part of that crop into this year. And, high current market prices could induce earlier sales from the 1978 crop.

With respect to cotton we foresee a decline in marketing receipts from last year. Weather reduced output, especially in the Texas high plains and California, cut into marketing volume without an offsetting price increase.

Tobacco growers are receiving record earnings with large outputs moving at higher prices. Cash receipts from tobacco have grown steadily over the past decade, but 1978 will mark the first large increase since 1974.

Other crops for which receipts are up sharply this year include a number of fresh vegetables, and the fruits and nuts complex. Unusual supply patterns and strong demand, rather than lower output, seem responsible for high prices and gains in receipts for some items such as spring lettuce. Tonnage of processing vegetables is off somewhat and prices slightly lower, somewhat moderating the rise in vegetable receipts.

Financial conditions for fruit and nut producers have been excellent in 1978, though some raisin producers lost their crop due to heavy rains during the first week of September. The prices received index for fruits and nuts will average about 40 percent higher in 1978 than last year. Smaller crops of most summer fruits and reduced nut production decreased volume but prices are up—receipts will likely total 20 percent higher.

Cash receipts from meat animals, broilers, and turkeys have increased sharply during 1978, as a result of price gains, with overall meat output fairly constant. Among the major livestock items only egg receipts will decline from last year; egg receipts have held close to \$3 billion annually since 1973.

Most cattle feeders turned a profit on fed cattle marketed during 1978 and substantial profits were made on cattle marketed during the second quarter. A sharp increase in fed cattle prices occurred during that quarter and fed cattle marketed at that time had been purchased as feeder cattle at relatively low prices. Subsequently, however, cattle feeders bid up the price of feeder cattle for feedlot placements and higher costs of production tempered cattle feeding profits to a large extent. Nevertheless, the financial condition of cattle feeders this year was the most improved since 1972, and early 1973.

After 4 successive years of unfavorable net earnings, 1978 provided some optimism among operators of cow-calf enterprises. Record domestic corn supplies have spurred demand for the reduced feeder cattle supply. As a result, feeder cattle prices going into this quarter averaged about 75 percent above those of a year ago.

Hog producers improved their financial position in 1978, following a relatively favorable year in 1977. Output expansion has been moderate and hog prices, relative to feed grain prices, have been favorable to pork producers.

Broiler and turkey producers were also in a good position to gain from reduced beef supplies. Both these groups enjoyed strong prices with significant gains in output and were able to cut back some on production costs; their profit margins were exceptionally strong throughout 1978.

Egg producers' returns in 1978 averaged positive but below those in 1977, because increased output in the first half had driven prices down. As egg production slipped toward year-earlier levels in the second half, prices moved above 1977 levels and producers' profits offset first half losses.

Finally, but not least important, dairy farmers have had another reasonably favorable year. While costs have risen, they were more than offset by considerably higher milk prices which have yielded higher cash receipts.

We anticipate increases in cash receipts for nearly all producer groups during 1979 particularly for livestock producers. Among the grains, rice is the only commodity under downward price pressure, and this could result in a decrease in receipts again next year. As usual some fresh fruit and vegetable receipts can be expected to fluctuate considerably.

THE CREDIT AND CAPITAL MARKETS REASSESSED

(By Donald E. Woolley, senior vice president and chief economist, Bankers Trust Co., New York)

The mood in the credit and capital markets has changed dramatically since the beginning of autumn. Only a little over a month ago, the financial markets were comparatively calm and the consensus among economists and other analysts was that interest rates probably would not rise appreciably higher. Instead, money market rates have pushed sharply upward, and long-term yields have firmed appreciably as well. Consequently, there is more than a little concern now that another credit crunch is in the making. But while there is considerable difference of opinion as to the outlook for credit conditions and the behavior of interest rates in the period ahead, the causes precipitating the present uneasy mood in the money and capital markets are abundantly clear.

CONTRIBUTING FACTORS

Most obvious, of course, is the greatly increased concern over inflation and the actions of the Federal Reserve, particularly the bold and unexpected moves on November 1 in defense of the beleaguered dollar. Since midsummer, the monetary authorities in an effort to slow the rapid growth of the money supply and to dampen inflationary pressures—and inflation psychology—have raised the Federal funds target rate from $7\frac{3}{4}$ percent at the beginning of August to around 10 percent currently, a sizable move in so short a period of time. Over the same period, the discount rate was pushed up from $7\frac{3}{4}$ percent and reached an unprecedented $9\frac{1}{2}$ percent. The Federal Reserve also increased reserve requirements on large CD's, adding about \$3 billion to the required reserves of commercial banks.

However, equally important—though not as widely recognized—in contributing to the sharp rise in interest rates is the sustained strong demand for credit throughout the economy. With business activity continuing to expand at a good pace and prices rising rapidly, business loan demand at the banks, after leveling off for a time during the summer, has resumed its upward climb. Particularly notable is the pickup in commercial and industrial loans at the large money center banks in New York and Chicago; bank loan demand is even stronger if the loans booked by U.S. branches of foreign banks in New York are included. At the same time, large industrial corporations are again relying heavily on the commercial paper market for short-term funds, and the volume of business borrowing from finance companies is likewise substantial.

Meanwhile, the growth of consumer credit recently has run only slightly behind the record pace earlier in the year. And, most unusual at this advanced stage in the business cycle, mortgage debt—residential as well as commercial—continues to expand at a rapid pace, notwithstanding record high mortgage rates.

LOOKING INTO 1979

Recent interest rate developments clearly raise new questions both as to the strength and staying power of the business expansion and the likely course of Federal Reserve policy in the months ahead. But even if, as seems likely, the sharp increase in money market rates puts a noticeable damper on real economic growth in 1979, private demands for short-term credit will remain strong for some time.

In the business sector, company managements will doubtless remain cautious about adding to inventories, and capital spending may slacken during the course of next year and will almost certainly continue to be weighted toward modernization and cost cutting rather than new plant construction. Still, the rapid rise in operating costs is widening the gap between the amount of funds generated internally by corporations and their working capital needs. Even with the reduction in the corporate tax rate from 48 to 46 percent, business earnings in 1979 are expected to show no improvement over this year, and they may well be down. Accordingly, needs for short-term financing will stay strong well into 1979, and an increased share of these borrowing requirements is likely to show up at the large money center banks.

The growth in consumer credit has been tremendous over the past year and with the employment outlook uncertain a great many consumers presumably will be reluctant to add to their already heavy debt load. Also, an unusually large proportion of the expansion in installment credit this year is reflected in automobile credit, and automobile sales are now on the decline. Nevertheless, the use of credit cards continues to expand, so that the net increase in consumer credit next year stands to be comparatively large, at least during the early months. All told, short-term financing—exclusive of Treasury borrowing—may well amount to as much as \$85 billion in 1979, only about 10 percent short of this year's record, with nearly all of the shortfall occurring after midyear.

LONG-TERM FINANCING

The amount of long-term money raised next year, too, could be nearly as great as the \$202 billion in sight for this year. But more important is the shifting about in the pattern of financing among borrowers which appears to be in the offing.

New corporate bond offerings, especially private placements, can be expected to pick up from the rather slow pace seen in the latter half of this year. Besides the further advance in capital spending in prospect, corporate liquidity has eroded noticeably over the past year and the ratio of short-term to long-term debt needs to be held in check and, for many companies, reduced. Though many business firms would obviously prefer to issue more common stock in order to improve debt-equity ratios, the stock market is not receptive to new issues, and corporations will continue to turn to the long-term debt market and to bank term loans for long-term funds.

Commercial mortgage debt should expand further in the coming months, given the strength apparent in office building, new store and warehouse construction, and other types of commercial building. In view of the sizable volume of contract awards, and other forward

commitments, for a time at least the growth here could come close to offsetting the curtailment in residential mortgage debt that is sure to accompany the indicated decline in housing starts, and a reduction in turnover of existing properties.

Municipal financing, too, is bound to recede in 1979. This year, the volume was bolstered materially during the winter and spring by a considerable amount of advance refunding of outstanding higher rate bond issues, which is now largely precluded under the new Treasury Department ruling; also, because of the much higher level of interest rates now, advance refunding is no longer attractive. And in the wake of California's Proposition 13, there is a greater reluctance on the part of many States and municipalities to float new bond issues to finance construction programs and ongoing public services.

TREASURY BORROWING

Many credit market analysts are looking for a further cutback in Treasury financing to bring some relief to the credit and capital markets next year. The latest official budget projections for this fiscal year call for a deficit of \$38.9 billion, about \$10 billion below last year's. But with the economy likely to be weaker in 1979, especially in the second half, than is currently assumed by the administration, there is a question whether the excess of expenditures over receipts in the current fiscal year will narrow nearly this much in the absence of prompt and aggressive action by the President to trim Federal spending. In any event, it would seem that a somewhat larger portion of the Treasury's cash needs next year will have to be raised in the open market.

In addition to the still sizable Treasury borrowing in prospect, financing by the Federal housing agencies promises to be fairly heavy through much of 1979. As with Treasury financing, the amount of agency borrowing in recent months has fallen short of expectations, as the large-scale issuance of the new 6-month certificates tied to the Treasury bill rate has enabled the savings and loan associations—and to a lesser degree the mutual savings banks—to hold onto existing deposits and, in many cases, to attract new savings. However, the housing agencies will have to step up their financing in the period ahead, since Fannie Mae and the Federal home loan banks will be called upon to provide greater support to the residential mortgage market next year.

THRIFTS UNDER PRESSURE

There is no longer any doubt that the availability of residential mortgage financing will be reduced moving into and through 1979; indeed signs of a tightening are already becoming evident. Over the next couple of months, a very large volume of the roughly \$15 billion of 6-month certificates tied to the Treasury bill rate issued earlier by the thrift institutions will be maturing. As these certificates will have to be rolled over at rates that are more than 200 basis points higher than when they were issued, while mortgage rates in a number of the States that have usury laws are up against the ceilings, many managements are confronted with an emerging squeeze on earnings. Accordingly, many savings and loan associations and mutual savings banks

have already stopped advertising the new 6-month certificates and have placed a cap on the rates they will offer. Some banks almost certainly will elect not to roll over all of their outstanding certificates, which will force them to step up their borrowing from the Federal home loan banks and to curtail their mortgage lending as well.

The rapid growth in commercial bank credit can be expected to slow as time goes on, too. Banks outside the large money centers, where the expansion in loans has burgeoned over the past year and more, are beginning to tighten. Some smaller banks are already fairly well loaned up and are selling loans to their large correspondent banks, including to the New York banks. And commercial banks as a group have been liquidating Government securities recently in order to accommodate the strong business and consumer loan demand. The strong business loan demand is also causing the large money center banks to bid aggressively for CD's, thereby pushing up their cost sharply. And the recent hike in reserve requirements on large CD's will further increase the cost of funds to the banks.

Looking ahead, the corporate bond market should continue to enjoy relatively good institutional support from the life insurance companies and pension funds moving into and through next year. These institutional investors are still enjoying good cash flows and remain quite liquid. In fact, the life insurance companies are actively seeking new private placement commitments for next year. In addition, the life companies will continue to invest heavily in mortgages on income producing properties, considering the relatively attractive yields and the greater opportunities for investment in this area now that commercial building is on a firmer footing.

The municipal bond market, though, could well face some problems in the coming months. With inflation adding to their underwriting costs, the fire and casualty companies may not be quite the avid buyers of tax-exempt securities in 1979 they have been this year. And there is the still bigger question whether the commercial banks will show as much interest in the municipal bond market in the coming months, given the continued strength of loan demand.

GOVERNMENT SECURITIES

The Government securities market is even more likely to experience strains. This year, as in 1977, the preponderance of the Treasury financing has been acquired by foreign central banks in support of the weakening U.S. dollar, and by States and municipalities from the proceeds of their sizable advance refunding operations.

The cutback in advance refunding activity virtually assures that State and local general funds will not be the big takers of Government securities in 1979 they have been this year. And it is not likely that foreigners will be acquiring the huge amount of Treasury obligations next year that they have recently; if the dollar steadies, there could well be a lightening of foreign official holdings. Among institutional investors, on balance, it is doubtful that the coming months will see larger purchases of Government securities, and some—the thrift institutions and commercial banks—may well cut back on their holdings. This means that individuals and investors other than the major financial institutions will have to take up the slack and this will require competitive interest rates.

INTEREST RATE OUTLOOK

In sum, prospective demand-supply conditions point to more tightening in the credit and capital markets and a further significant firming in interest rates. The extent of the tightening, and just how fast and how far the advance in rates may carry, will depend on the actions of the Federal Reserve and on the reactions of both borrowers and lenders to developments in the inflation arena and to the greatly elevated costs of financing.

In appraising the probable course of monetary policy, it must be recognized that even though the Federal Reserve has pushed up interest rates appreciably over the past few months, the economy still has momentum and the growth of the money supply has not yet been brought within the official target range. Also, it should be kept in mind that continued stability of the dollar is no means assured and will depend upon the assessment still to be made by the foreign exchange markets as to the administration's determination to combat inflation effectively, including the demonstrated resolve of the monetary authorities.

Until there are convincing signs that inflationary pressures are subsiding and that inflationary expectations have begun to diminish the Fed will have little choice but to tighten monetary policy further. If the Federal Reserve starts to waver at the first signs of a decline in housing or a softening elsewhere in business activity, the upward pressures on interest rates will surely be intensified.

FARM FINANCE AND REAL ESTATE MARKETS— SITUATION AND OUTLOOK

(By Larry A. Walker, Agricultural Economist, National Economic Analysis
Division, ESCS, USDA)

Net farm income before inventory adjustment for 1978 is forecast at about \$26 billion—up about 30 percent from last year's and only 5 percent below the 1974 level. These net income prospects are restoring optimism within the farm sector and vitality to farmland buyer and seller expectations. The rate of land transfer appears to be above last year's, and lenders expect land values to increase from 8 to 10 percent for the year ending next February 1. These two factors will combine to assure strong demand for real estate loan funds into 1979.

Given this brief introduction, I now wish to share with you some of my thoughts concerning the following five areas:

1. Real estate finance markets,
2. Nonreal estate finance markets,
3. The Revenue Act of 1978,
4. Effects of inflation on foreign demand for U.S. farmland, and
5. The relationship between net farm income and land values.

REAL ESTATE FINANCE MARKETS

Even though real estate lenders passed through the agricultural cost-price squeeze of 1977-78 relatively unscathed, the financial position of the borrowers is considered much improved over last year's and presently strong due to the considerable improvement in farmer cash flows. Loan repayment rates are as good or better than last year's, and delinquencies continue at low levels. Loan demand is increasing during the second half of 1978, but funds are reported adequate.

Farm real estate debt outstanding is expected to reach \$72.2 billion by January 1, 1979—up 14.1 percent for the year and the largest annual percentage increase since 1973 (table 1). This year's increase results from a combination of higher land prices, a slight increase in land transfer rates, the securing of short-term debt with long-term mortgages, and an increase in the rate of refinancing short- into long-term debt. However, contrary to previous opinion, the rate of this type of refinancing has experienced an insignificant increase compared to general levels throughout the rest of the 1970's (tables 2 and 3).

Lender shares of the real estate market show little change from last year, but life insurance companies are continuing their competitive expansion. This year they are expected to increase their debt outstanding by 17.9 percent—the largest annual percentage increase since 1921.

TABLE 1.—FARM DEBT OUTSTANDING¹

Lenders	January 1 (billions)				Change ² (percent)			Market share of debt (percent)	
	1974	1977	1978	1979 ³	1974-79	1973-78	1978-79	1978	1979
Real estate debt:									
Federal land banks.....	\$10.9	\$18.5	\$21.4	\$24.5	125	16	14	34	34
Life insurance companies.....	6.0	7.3	8.5	10.0	57	15	18	13	14
All operating banks.....	5.5	6.8	7.8	8.6	68	15	10	12	12
Farmers Home Administration ⁴	3.0	3.7	4.0	4.4	46	9	10	6	6
Total institutional lenders.....	25.4	36.3	41.6	47.5	87	15	14	66	66
Individuals and others ⁵	15.9	20.3	21.7	24.8	75	7	14	34	34
Total.....	41.3	56.4	63.3	72.2	75	12	14	100	100
Nonreal estate debt:									
All operating banks.....	17.2	23.3	25.7	27.6	61	10	7	46	43
Production credit associations.....	7.8	12.2	13.5	14.7	88	10	9	24	23
Federal intermediate credit banks ⁶.....	.3	.4	.4	.4	12	2	-1	1	1
Farmers Home Administration.....	.9	1.9	3.1	5.4	516	67	72	6	8
Total institutional lenders.....	26.2	37.8	42.7	48.1	83	13	12	77	75
Individuals and others ⁷	5.9	7.0	8.2	10.1	71	15	20	15	16
Total (excluding CCC).....	32.1	44.7	51.1	58.2	81	13	14	92	91
Commodity Credit Corporation loans.....	.8	1.0	4.5	5.5	633	344	23	8	9
Total.....	32.9	46.1	55.5	63.7	94	21	14	100	100
Total farm debt.....	74.1	102.2	120.0	135.9	83	16	14		

¹ Totals may not add due to rounding.² Calculated from unrounded data.³ Estimated.⁴ Includes direct and insured farm ownership, farm housing, soil and water related loans secured by farm real estate.⁵ Includes seller and other individual financing of farm real estate sales and unclassified credit sources.⁶ Loans to and discounts for other financial institutions.⁷ Includes merchants and dealers, individuals, and all other unclassified credit sources.TABLE 2.—FEDERAL LAND BANKS: PERCENTAGE DISTRIBUTION OF THE PURPOSES FOR LOANS CLOSED FOR THE YEARS ENDING DEC. 31, 1970-77¹

	1970	1971	1972	1973	1974	1975	1976	1977	1st half 1978
Farm real estate purchases.....	21.7	23.1	31.2	32.1	35.8	31.4	34.5	31.6	32.6
Refinancing:									
Mortgages held by—									
Own company.....	18.9	18.3	19.7	15.7	14.7	16.9	18.8	20.8	20.2
Others.....	21.1	22.6	17.3	17.2	17.6	19.2	15.2	15.0	16.1
Total.....	40.0	40.9	37.0	32.9	32.3	36.1	34.0	35.8	36.3
Short-term loans held by others.....	14.0	12.9	11.5	10.9	9.9	12.3	10.5	12.8	12.9
Total refinancing.....	54.0	53.8	48.5	43.8	42.2	48.4	44.5	48.6	49.2
Repairs and improvements to land and buildings.....	10.6	9.9	9.6	14.0	11.9	9.7	11.0	10.0	8.5
Other purposes.....	13.7	13.2	10.7	10.1	10.1	10.5	10.0	9.8	9.7
All purposes ²	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

¹ From Farm Credit Administration.² Summation may not equal exactly 100 percent due to rounding.

TABLE 3.—LIFE INSURANCE COMPANIES: PERCENTAGE DISTRIBUTION OF THE PURPOSES OF FARM MORTGAGE LOAN COMMITMENTS FOR YEARS ENDING DEC. 31, 1956-77¹

[Percent]

	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1st half 1978
Farm real estate pur- chases.....	35.1	39.1	37.0	35.5	31.0	31.6	33.6	35.2	36.8	37.2	40.9	35.7	35.5	29.4	16.6	21.3	31.6	35.0	33.1	28.2	32.5	33.8	35.8
Refinancing:																							
Mortgages held by—																							
Own company.....				16.2	16.4	20.5	21.8	21.6	21.6	22.2	18.7	22.6	18.3	21.9	28.0	23.8	17.7	13.3	14.9	18.7	19.8	19.3	18.2
Others.....				12.4	14.1	13.2	12.7	11.0	9.6	8.4	7.7	8.6	10.7	7.0	6.3	7.1	11.9	9.7	11.8	14.2	13.0	10.5	9.7
Totals.....	32.2	30.8	28.0	28.6	30.5	33.7	34.5	32.6	31.2	30.6	26.4	31.2	29.0	28.9	34.3	30.8	29.6	23.0	26.7	32.9	32.9	29.8	27.9
Short-term loans held by others.....	14.0	13.3	15.7	15.9	19.5	19.1	16.8	16.1	16.7	15.8	15.5	15.5	18.9	18.3	21.2	20.0	17.6	17.7	19.3	21.1	13.9	15.4	15.6
Total refinancing.....	46.2	44.1	43.7	44.5	50.0	52.8	51.3	48.7	47.9	46.4	41.9	46.7	47.9	47.2	55.5	50.8	47.2	40.7	46.0	54.0	46.8	45.2	43.6
Repairs and improve- ments to land and buildings.....	8.7	6.9	7.5	7.5	6.9	6.9	7.6	7.4	7.7	7.8	7.1	9.1	8.4	10.8	10.9	11.5	13.7	15.8	14.7	8.7	12.7	9.9	10.4
Other purposes.....	10.0	9.9	11.8	12.5	12.1	8.7	7.5	8.7	7.6	8.6	10.1	8.5	8.2	12.6	17.0	16.4	7.5	8.5	6.2	9.1	8.0	11.2	10.2
All purposes ²	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

¹ From Quarterly Farm Mortgage report² Summation may not equal exactly 100 percent due to rounding.

Possibly the major concerns of potential borrowers currently are credit availability and rising interest rates. At present, the effects of the increasing short-term money rates have not had an appreciable effect. Federal land banks (FLB's) do obtain much of their loan funds from the short-term money markets, but because of their variable interest rate program, new borrowers are charged on an average cost rather than marginal cost basis. Such spreading of costs lessens the effect of fluctuating rates in the money markets in both an upward and downward direction.

Life insurance companies have not realized any significant effects either. The long-term bond market has not reflected the large increases in short-term rates. The fact that business is not looking into the long-term money markets indicates the expectation that rates will be dropping during 1979. Increases in life insurance company interest charges thus far during 1978 have been based more on the higher amounts that borrowers are willing to pay in obtaining the loan funds than on a shortage of fund availability. Also, it must be noted the current rates charged by life insurance companies and FLB's on their new loans are still lower than those charged in 1976.

The higher money market rates may have most impact on commercial banks. Between May and August, the average effective interest rate on farm loans made by banks increased from 9.3 to 9.6 percent. These rates may continue upward, approaching 10 percent by early 1979. Even if the short-term money market rates began decreasing now, the average rate charged to bank borrowers could not be expected to drop below 9 percent by 1979. Combining the present rising interest rate situation with the discount rate being raised from $8\frac{1}{2}$ to $9\frac{1}{2}$ percent and the already high loan-to-deposit ratios, some bank customers may seek service from other lenders.

NONREAL ESTATE FINANCE MARKETS

Although loan-to-deposit ratios in commercial banks are high and collateral requirements have increased, there has been some easing in loan repayment problems and less need for extensions and renewals. Factors involved in alleviating the loan problems include improved farm income, Government lending, borrower counseling, and debt restructuring. Loan demand is strong presently, especially increasing during the last half of 1978. However, credit availability is tight in the commercial banking sector.

Farm nonreal estate debt outstanding is expected to reach \$63.7 billion by January 1979—up 14.5 percent for the year. Government lending is the major factor responsible for this year's amount of increase. Commercial banks' debt outstanding will have risen 7.3 percent—the lowest rate of increase since 1974; and Production Credit Association (PCA) debt outstanding will have increased 9 percent—the lowest rate of increase since 1972.

Machinery manufacturer and dealer financing has also slacked off. Their outstandings are expected to increase only 3 percent during 1978 compared with 40 percent in 1977. This coincides with the increased demand for farm machinery since May. Until then, unit sales had been steadily declining since 1973.

The American Bankers Association's annual farm credit survey showed commercial bankers reporting a noticeable improvement in credit conditions by mid-1978 over a year ago, especially in the Plains and Western States. They also anticipated further improvement in overall farm credit conditions for the coming year. When asked how they rated the quality of their farm loan portfolios versus their business loan portfolios, 51 percent ranked them the same and 41 percent said that their farm loan quality was better. However, this may be partly indicative of the dependence of the local businesses on the prosperity of the surrounding farmers.

PCA's collection rates for the first 9 months of 1978 were higher than during any of the past 3 years. Both PCA and bank collections have been enhanced by the large influx of lending from the Commodity Credit Corporation (CCC), Farmers Home Administration (FmHA), and Small Business Administration (SBA). For example, CCC loans outstanding are expected to increase approximately \$1 billion during 1978. FmHA and SBA short-term debt expansion continued to be mostly in their emergency/disaster loan programs. In total, these emergency/disaster loan programs accounted for \$3.5 billion, or 40 percent of the total nonreal estate debt expansion for 1978.

The topic of interest rates was largely covered in the previous section, but the subject of credit availability deserves additional comment. Although PCA's will have no problems obtaining loan funds, the high loan-to-deposit ratios of commercial banks already appear to be causing problems in some areas. However, many of these problems should be alleviated by the new FmHA economic emergency loan program; \$2½ billion have been allocated to this program for fiscal year 1979.

REVENUE ACT OF 1978

The Revenue Act of 1978, signed by President Carter on November 6, will have an important impact on our land markets and the form of business organizations operating within our farm sector. I will briefly discuss two of its provisions.

First, its provision reducing the tax rate on long-term capital gains will have the side effect of further encouraging high income individuals to convert ordinary income into long-term capital gains, thereby reducing tax liabilities. The changes within this provision may result in an additional upward pressure on land prices.

Second, its provision changing corporate tax rates will give greater tax advantages to incorporation. These changes are summarized in the following table:

[In percent]

Net income	Tax rate under old law	Tax rate under Revision Act of 1978
1st \$25,000.....	20	17
2d \$25,000.....	22	20
3d \$25,000.....	48	30
4th \$25,000.....	48	40
Over \$100,000.....	48	46

Note: Since these rates are lower than what a private individual is subject to, the legislation will encourage incorporation and stimulate expansion.

EFFECT OF INFLATION ON FOREIGN DEMAND FOR U.S. FARMLAND

The devaluation of the American dollar is an important consideration in the analysis of foreign investor interest in U.S. farmland. During the year ending September 1, 1978, the value of the dollar, compared with currencies of the six free industrial nations shown in table 4, depreciated, ranging from a decline of 10.5 percent in Britain to a 32.8-percent decrease in Switzerland. The effect this has on foreign investor interests is shown in table 5. For example, the Swiss, who with the same number of francs that would have allowed him to pay \$1,000/acre last year, could offer \$1,488/acre a year later. Even the British citizen, who experienced the least appreciation of his currency versus the dollar, of the countries shown, received a \$117/acre bidding advantage due to the devaluation. In conclusion, the devaluation of the dollar has provided many of the potential foreign buyers a significant bidding advantage.

RELATIONSHIP BETWEEN NET FARM INCOME AND LAND VALUES

This relationship has often been referred to as a paradox during the last 30 years. However, I am going to take an opposite view on the premise that the aggregate data used in prior analyses were, at the best, used improperly.

First, a strong argument can be made that figures 1, 2, and 3 take the analyst through successively more appropriate comparisons between changes in land values and net income before inventory adjustment. To more rigorously substantiate my hypothesis that the relationship between changes in land values and farm income over time has not been a paradox, I turned to the USDA's series on annual cash rent for whole farms and selected data for Iowa to make a preliminary test. This series was obtained from annual surveys of farmers who were asked the current cash rent for typical whole farm units in their respective vicinities and the price of the land so rented.

A major portion of my analysis entailed ascertaining the relative profitability of investing in the farmland, based upon the rate of return derived from only the net cash rent stream, compared with alternative investment opportunities. To compare the profitability of owning the land versus the alternative investments, I calculated the discounted current value of the rate of return from the annual net income streams derived from owning the land and from alternative investments. The alternative investments were assumed to offer fixed, annual rates of return ranging from 3 percent up through 9 percent. The discount rate used was always set equal to the rate of return on the alternative investment. For example, when the rate of return on land was compared with that of an alternative offering a 6-percent annual rate, then a 6-percent discount rate was used, also.

The results are shown in table 6. For example, part (a) shows that an investor buying Iowa farmland in 1965 had to hold his land 7 years until the net discounted current value of the rate of return derived from his annual net rent stream surpassed that of an alternative investment providing an annual 6-percent rate of return, based on a 6-percent discount rate. For a better perspective, table 7 summarizes rates of return from some alternative investments available at that time. Of the alternatives shown for 1965, it appears that land was

the most profitable. It did take 7 years, but even 10- to 20-year maturities on alternative long-term investments are not uncommon. Further comparisons of tables 6, 7, and 8 indicate that, at least for the years shown, land seems to have been the prudent investment over the long term. Granted, these results are from only a preliminary analysis of one State, but I have already begun a complete analysis of Iowa along with 13 other States, and the raw data indicate similar results.

In conclusion, with this data I am not trying to predict the future, nor am I saying that current land prices are justified. What I am saying is that the data provide an extremely convincing case that, for over the past 30 years, those who said the relationship between farm incomes and land values did not make sense were apparently wrong.

TABLE 4.—DEVALUATION OF THE AMERICAN DOLLAR

[Between Sept. 11, 1977 and Sept. 11, 1978; Prices for foreign banknotes, as quoted on the last business day (in dollars)]¹

Selected foreign country	Buying, Sept. 11, 1977	Buying, Sept. 11, 1978	Devaluation of American dollar (percent)
Britain (pound).....	1.71	1.91	10.5
France (franc).....	.19	.22	13.6
West Germany (mark).....	.42	.50	16.0
Italy (lira).....	.0009	.0011	18.2
Japan (yen).....	.0035	.0051	31.4
Switzerland (franc).....	.41	.61	32.8

¹ Source: Wall Street Journal.

TABLE 5.—EFFECT OF THE DEVALUATION OF THE AMERICAN DOLLAR

[Between Sept. 11, 1977 and Sept. 11, 1978, assuming an initial parity position between U.S. dollar and selected foreign currencies on Sept. 11, 1977: Price that selected foreign investors could pay per acre of U.S. farmland on Sept. 11, 1978, given the same money stock of their respective currencies that would have enabled them to pay \$1,000 1 yr earlier]

U.S. farmer, United States	Foreign investor					
	British	French	West German	Italian	Japanese	Swiss
\$1,268	\$1,117	\$1,157	\$1,190	\$1,222	\$1,458	\$1,488

FIGURE 1. --NATIONAL FARMLAND VALUE INDEX VS INDEX OF NET FARM INCOME BEFORE INVENTORY ADJUSTMENT FOR ALL FARMS.

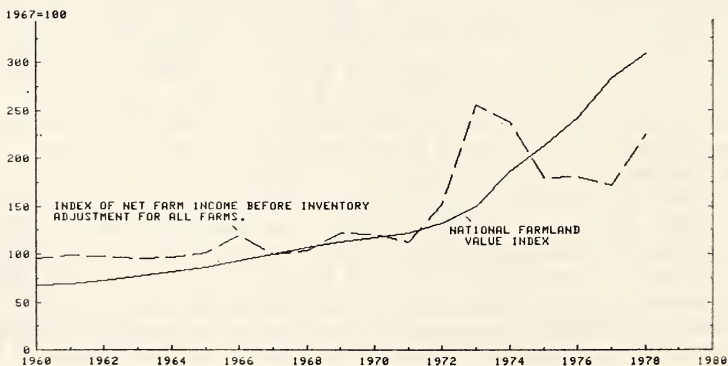
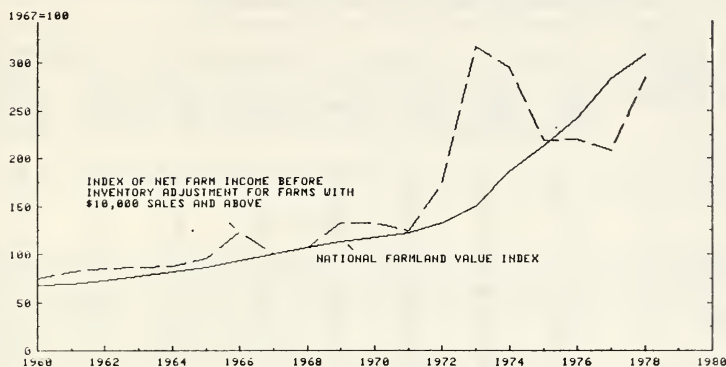


FIGURE 2. --NATIONAL FARMLAND VALUE INDEX VS INDEX OF NET FARM INCOME BEFORE INVENTORY ADJUSTMENT FOR FARMS WITH \$10,000 SALES AND ABOVE. ^{1/}

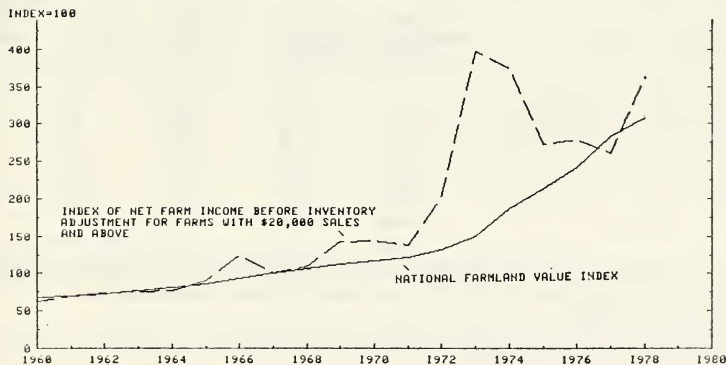


^{1/} ESTIMATE FOR 1970'S NET FARM INCOME BEFORE INVENTORY ADJUSTMENT FOR FARMS WITH \$10,000 SALES AND ABOVE IS MY OWN. I DERIVED IT BY REGRESSING THIS INCOME GROUPING AGAINST THE FOLLOWING 2 VARIABLES:

a) NET FARM INCOME BEFORE INVENTORY ADJUSTMENT FOR ALL FARMS.

b) TIME.

FIGURE 3. --NATIONAL FARMLAND VALUE INDEX VS INDEX OF NET FARM INCOME BEFORE INVENTORY ADJUSTMENT FOR FARMS WITH \$20,000 SALES AND ABOVE. ^{1/}



^{1/} ESTIMATE FOR 1970'S NET FARM INCOME BEFORE INVENTORY ADJUSTMENT FOR FARMS WITH \$20,000 SALES AND ABOVE IS MY OWN. I DERIVED IT BY REGRESSING THIS INCOME GROUPING AGAINST THE FOLLOWING 2 VARIABLES:

a) NET FARM INCOME BEFORE INVENTORY ADJUSTMENT FOR ALL FARMS.

b) TIME.

TABLE 6.

[Number of years required to hold Iowa farmland until—(a) the discounted present value of the net rate of return derived from the net cash rent stream exceeds the discounted present value of the rate of return derived from an alternative investment providing a constant, annual income stream; (b) the discounted present value of the net rate of return derived from the net cash rent stream exceeds the original purchase price]¹

Rate of return on alternative investments	1935	1940	1945	1950	1955	1960	1965	1970	1975
Part (a) years:									
3-----	1	1	1	1	1	1	1	1	1
4-----	4	1	1	8	4	2	1	1	1
5-----	13	5	11	17	14	10	3	2	1
6-----	22	12	19	24	20	15	7	5	3
7-----	32	20	27	27	23	18	11	7	-----
8-----	42	29	33	-----	-----	-----	13	9	-----
9-----	-----	38	-----	-----	-----	-----	-----	-----	-----
Part (b) years:									
3-----	22	19	21	23	21	18	14	-----	-----
4-----	24	20	23	24	22	18	² (15)	-----	-----
5-----	27	22	25	26	23	² (20)	² (16)	-----	-----
6-----	32	25	28	29	² (25)	² (21)	-----	-----	-----
7-----	37	29	32	31	-----	-----	-----	-----	-----
8-----	44	34	² (35)	-----	-----	-----	-----	-----	-----
9-----	-----	39	-----	-----	-----	-----	-----	-----	-----

¹ The discount rates used equal the designated rates of return on the alternative investments.

² Using estimated rents.

TABLE 7.—COMPARATIVE RATES AND YIELDS ON SELECTED BONDS AND MONEY RATES IN THE UNITED STATES FOR SELECTED YEARS

[In percent]

Year	Long-term government bonds ¹	Municipal (high grade) bond yields ²	Industrial bond yields ³	Short-term Treasury obligations ⁴	Rates on price commercial paper (4 to 6 mo) ⁵
1935-----	-----	3.41	4.02	0.14	0.76
1940-----	-----	2.50	3.10	.01	.56
1945-----	2.37	1.67	2.68	.38	.75
1950-----	2.32	1.98	2.67	1.21	1.45
1955-----	2.84	2.53	3.19	1.75	2.18
1960-----	4.02	3.73	4.59	2.93	3.85
1965-----	4.21	3.27	4.61	3.95	4.38
1970-----	6.59	6.51	8.26	6.46	7.72
1975-----	6.98	7.05	9.25	6.08	6.48

¹ Board of Governors of Federal Reserve System. Prior to Apr. 1, 1952, only bonds due or first callable after 15 years were included. From Apr. 1, 1952, through Sept. 30, 1955, consists of fully taxable, marketable 2½-percent bonds due or first callable after 12 years. Beginning Oct. 1, 1955, consists of those due or callable in 10 to 20 yr.

² Standard & Poor's Corp.

³ Moody's Investors Service.

⁴ Average yield on new offerings of Treasury bills (1935-1975). Maturities of bills varied from 3 to 9 months for 1935, but have all been for 3 months since 1937.

⁵ Board of Governors of Federal Reserve System. Prevailing open market rates in New York City.

TABLE 8.—AVERAGE INTEREST RATES ON LONG-TERM DEBT OUTSTANDING HELD BY FARM REAL ESTATE LENDERS IN IOWA

Year	Farm real estate lender (interest rates)					All lenders
	Federal land banks	Life insurance companies	Banks	Individuals	Others	
1935-----	-----	-----	-----	-----	-----	5.2
1940-----	3.6	4.6	4.8	4.4	4.5	4.2
1945-----	4.0	4.3	4.2	4.2	4.2	4.2
1950-----	4.0	4.1	4.1	4.0	4.1	4.1
1955-----	4.0	4.2	4.4	4.1	4.2	4.2
1960-----	4.3	4.6	-----	-----	-----	4.5
1965-----	5.0	5.1	5.5	4.7	4.9	5.0
1970-----	5.8	5.6	6.2	5.3	5.5	5.6
1975-----	7.8	6.9	8.0	-----	-----	6.9

PROJECTED GOVERNMENT CREDIT ACTIVITY IN 1979 WITH RESPECT TO AGRICULTURE AND RURAL AREAS—FmHA ACTIVITY AND PROGRAMS

(By James E. Thornton, Associate Administrator, Farmers Home Administration)

This has been a year of action by Congress and the administration to reinforce the credit structure supporting American agriculture.

The backup role of the Farmers Home Administration has been increased.

The Farm Credit Act of 1978 raised FmHA loan limits, broadened the rules of eligibility for FmHA credit, and improved our ability to stimulate private lending through loan guarantees.

And we have a new authority, the economic emergency loan, to help farmers out of a credit squeeze brought on by economic distress such as high cost and low return.

Farmers Home has just come through a record \$5 billion year of agricultural lending in fiscal 1978—twice the volume of just a year ago. 1978 was the first fiscal year since 1969 that farm credit exceeded rural housing in FmHA's total volume of farm and rural development credit.

This \$5 billion level of farm lending is expected to continue in 1979. As in the past year, more than \$3 billion will be devoted to easing financial emergencies for farmers and ranchers. The rest will go for the purposes traditional to FmHA's reason for existence—helping limited resource farmers and low-income young farmers, other family farmers lacking conventional sources of credit for their real estate and operating needs; for projects that contribute to better use of soil and water resources, irrigation systems, pollution control, Indian tribal land recovery, and other special purposes.

Percentagewise, the FmHA share of all agricultural credit remains modest as compared to the private sector. As the principal Government lender in agriculture, we'll hold about 7 percent of all farm credit outstanding on January 1, 1979—about \$9.8 billion out of \$136 billion as estimated by the Economics, Statistics, and Cooperatives Service of USDA (ESCS).

But the FmHA share of production credit is up 3 points over the past year, from about 5½ to 8½ percent. The real estate share holds at a fraction over 6 percent.

The upsurge in production credit reflects more than \$3½ billion of FmHA lending the past fiscal year to farmers eligible for emergency credit. About \$3.4 billion of this lending was based on drought and other recent natural disasters. About \$75 million was added by the emergency livestock program, and \$108 million by the new economic emergency loan program.

For 1979, the terms and varieties of FmHA farm loan programs have been recast to be more responsive to the needs of today. This has

been accomplished both through legislation and administration efforts.

I reviewed our goals along these lines in our Outlook Conference report of a year ago. Let me summarize now the extent to which those goals have been fulfilled.

Last year at this time, we were working with the Congress on revisions to the Consolidated Farm and Rural Development Act and the National Housing Act to—

Raise the loan limits in FmHA farm loan program;

Establish cost-of-money interest rates where practical, in order to minimize credit subsidies and allow a larger volume of lending;

Expand the amount of farm and rural home lending by private credit institutions through FmHA guarantee;

Open up FmHA nonemergency farm loan services to family-size farms operated as family partnerships and corporations;

Provide better credit opportunities to low-resource families to develop their farming and become owners of adequate homes; and

Change the agency name to Farm and Rural Development Administration—a name more appropriate to our role as a multipurpose credit agency, delivering services in agriculture, rural housing, rural community facilities, and rural business-industrial development that now total over \$11 billion a year.

All of these authorizations except the change of name have now been enacted.

In addition, certain other highly significant ideas were introduced and adopted as the legislation took final form this year. The Agricultural Credit Act signed by President Carter on August 4 also raised grant limits in the rural water and waste disposal program to 75 percent of projects cost, and set up the economic emergency loan as a major form of relief for the farmer caught up in unmanageable debt due to economic conditions beyond his or her control.

The new terms of our regular, nonemergency farm credit programs, under title I of the Credit Act of 1978, are these:

Limits on insured loans made directly by FmHA are doubled—to \$200,000 for farmownership and other real estate loans, and \$100,000 for a production loan. Limits on loans by private lenders guaranteed by FmHA are \$300,000 for real estate, \$200,000 for production. These changes bring the FmHA loan limits more into line with family-farm credit requirements under current economic conditions.

Interest rates on insured loans, both real estate and production, will ordinarily be the Government's cost of money (what the Government pays to investors in Government securities who supply funds loaned by FmHA), plus an administrative add-on of up to 1 percent. Under this formula, the present rate to borrowers is 8½ percent. Commercial lenders make guaranteed loans at rates negotiated with borrowers, but are expected to use the rate they give their best customers.

Less than cost-of-money rates may be authorized by the Secretary of Agriculture for loans to small farmers of such limited resources that they could not pay the full rate. The beginning of repayment on limited-resource farm loans may be deferred for 3 years. Under the current interest rate schedule, these loans for real estate purposes can draw 3 percent interest for the first 3 years of repayment; then 5 percent for an indefinite period, until the borrower prospers to the point of being able to afford the cost-of-money rate. Limited-resource

production loans carry a minimum rate of 5 percent, with graduation to full rate as soon as possible. The repayment ability of limited-resource borrowers is reexamined every 2 years.

Terms of repayment can still be a maximum of 40 years for real estate loans, and are liberalized to 7 years for operating loans other than those that cover annual recurring expenses. Production loans can be rescheduled for up to 7 additional years, and under special conditions can be repaid over 20 years.

Eligibility for FmHA nonemergency credit previously was restricted to family farmers operating as individuals. Now it is open to partnerships, corporations, and cooperatives whose members are related by blood or marriage, and whose operation is on the family-size scale. This is a change expected to bring about 60,000 more farms into eligibility for FmHA credit. Eligibility is still restricted to American citizens, and to those who find no credit available except through an FmHA-insured loan or guarantee.

And now to summarize the new economic emergency loan.

It is established under title II of the 1978 Credit Act. It has been characterized by President Carter as a measure that, for many farmers of the highest ability and diligence, may "mean the difference between staying in farming and being driven out."

In the language of Congress, it is a refinancing opportunity for the farmer who has become overburdened with debt due to forces beyond the farmer's control, such as "a general tightening of agricultural credit or situations such as high production costs and low prices for farm goods." Many farmers found themselves in that predicament during 1978, unable to secure further credit from their usual sources. It was the economic legacy of several years of cost-price inequities.

This program is open to any farmer, partnership, corporation, or cooperative whose situation corresponds to the definition of economic emergency. Where questions of priority arise, preference goes to the operation in which primary operation and management is done by the farm family.

The limit on an economic emergency loan is \$400,000, but a borrower may carry a maximum of \$650,000 economic emergency and other types of FmHA loans combined.

Loans may be used to pay installments of principal and interest on farm or ranch debt; refinance existing debts incurred from operations; change or reorganize an operation so it will be economically viable; pay operating expenses; make farm improvements except for the purchase of additional land; refinance nonfarm real estate debts at rates and terms within their repayment ability.

We will consolidate, reschedule, reamortize, or defer (up to 3 years) loans for operating purposes or for annual recurring expenses, if necessary to help a farmer who has run into problems getting back on an orderly repayment schedule. Collateral in the form of crops, livestock, farm machinery, and real estate will be taken insofar as available, but exceptions can be made in taking account of the applicant's repayment ability.

Otherwise, the cost-of-money interest rates and other conditions prevailing in regular FmHA real estate and production loan programs apply to insured economic emergency loans. Negotiated "best customer" rates apply for guaranteed loans made by other lenders. It

is a major purpose of the act to try to preserve the relationship between farmers and commercial lenders who have served them, hence a hope that about half of the credit generated by this program will take the form of guaranteed loans. Guarantees cover 90 percent of any loss a lender might take.

The act authorizes FmHA to carry as much as a \$4 billion principal outstanding in economic emergency loans at any one time.

Lending began within the week after President Carter signed the bill on August 4. Loans made totaled \$223 million by the end of October, and the program is still gaining momentum. At least \$2 billion is in prospect for 1979. The program is now timed to expire on May 15, 1980.

Somewhat parallel to the economic emergency program is the Emergency Livestock Credit Act authority for FmHA to guarantee other lenders' loans to livestock producers affected by adverse economic conditions. That limited program, originated in 1974, has been extended by Congress to September 30, 1979. It may be superseded in some degree by the more general EE program.

Economic emergency has just gained full acknowledgement as a disaster situation that can overwhelm the farmer.

Natural disaster assistance is one of the longstanding FmHA loan services, and it soared to the unprecedented level of \$3.4 billion during the past year—this in the wake of drought losses and other weather misfortunes experienced by farmers during 1976 and 1977, and coming at a time of widespread credit difficulties in the private market.

Even without new major disasters in the coming year, disaster emergency loans probably will continue at a billion-dollar level through fiscal 1979. This is due in part to the law's provisions that a farmer who becomes a disaster emergency borrower may get subsequent credit for 6 more years, if necessary, to bring the operation back to par.

This year's legislation makes some changes in our natural disaster emergency program. Loans against actual loss for disasters occurring on or after October 1 of this year will cost the borrower 5 percent interest; other loan amounts based on disaster eligibility will bear a prevailing market rate determined by the Secretary—now $8\frac{1}{2}$ percent. Loss loans for disasters occurring between July 1, 1976, and September 30, 1978, have a limit of \$250,000, but the borrower will pay 3 percent. Other lenders making FmHA-guaranteed disaster emergency loans will receive not more than the market rate—now $8\frac{1}{2}$ percent—with FmHA subsidizing the difference between that rate and what borrowers pay for loss loans. It is still required that borrowers show no other credit available before receiving FmHA insured or guaranteed natural disaster loans.

The new credit act has enabled Secretary of Agriculture Bergland to take action to speed up FmHA response to natural disaster. He has abolished a previous cumbersome system that called for county governments and State Governors to recommend, and the Secretary to approve most designations of counties as eligible for disaster credit. Loans now can be authorized by the Farmers Home State Director as soon as he or she confirms the need.

Certain technical improvements in the handling of guaranteed loans are of interest to commercial lenders. Congress has abolished the troublesome requirement that guaranteed borrowers may have

to "graduate" and refinance without a guarantee during the life of a loan. Provision also is made for the secondary marketing of the 90-percent guaranteed portion of a loan, so that these shares become 100-percent guaranteed instruments. These changes that may encourage more other lender participation in the FmHA programs.

We expected a year ago that Congress would clear up duplications and contradictions in the farm loan services of FmHA and the Small Business Administration.

That action failed to materialize, and it was one of the reasons given by the President for his recent veto of a small business bill that still obligated SBA to lend to farmers. That agency and the President still contend that farm credit is a line of duty burdensome to SBA, one for which the agency is ill equipped. The President has asked again that Congress relieve the Small Business Administration of agricultural lending.

For the present, with disapproval of the new legislation, SBA reverts to a previous law under which its interest rates on emergency loss loans are higher than those of FmHA, although SBA still does not require the test for credit.

In total, FmHA operations for fiscal 1979, some \$7 billion of our \$12 billion total program budget, will apply to elements of rural development other than agriculture. They include:

The still massive need for better housing in towns and countryside alike;

Rounding out a full complement of essential public facilities in rural communities; and

Business-industrial development to provide more opportunity for people to find work in rural areas.

These missions, and our role in farm credit, are not disconnected, unrelated packages. They constitute a spectrum of common need in the countryside communities of America. Agriculture is the foundation of rural society and rural economy. At the same time, most rural Americans live in counties where less than 10 percent of the employed residents work directly in farming.

By the nature of its locally based, county-by-county service structure and its broad experience in rural finance and rural development, Farmers Home Administration constitutes a one-stop service system for the delivery of Federal assistance to rural areas.

And this Administration is moving with great emphasis to improve this delivery system, and inject better qualities of leadership and cooperation into FmHA's working relationship with the States and local communities where we serve.

During the past year, we have moved from the planning to action phase in our program to revamp our FmHA field office structure, looking both to immediate and long-range goals.

County offices are near the point of being relieved of all but individual lending in farm and housing programs. A new type of substate district office is being created to handle community and organization loans and grants.

In all cases, the grouping of counties within FmHA districts will be the same as in substate development planning districts. This will enable us to coordinate better with the development objectives adopted in rural areas, and help to develop and support investment strategies that will bring about fulfillment of those local and area goals.

We intend to function more as a development agency, and less as a lender taking no interest in factors looking beyond the immediate loan or the single project. We feel that we can stay true to our basic purpose of providing for minimum basic needs of the most distressed rural people and communities, while considering the broader context of State and local development plans and goals. We have recently taken a lead in initiating studies to pin down answers to what rural America needs—to strengthen the economy, assure healthful and adequate water, provide decent shelter, establish basic community facilities, and bring reasonable health and transportation services for all people on farms and in small towns who need it most.

There are questions about personnel to accomplish all we aim for in this program for improving and extending our services. We loaned last year four times as much money as in the year 1971 with approximately the same number of full-time staff. We carry now a caseload of 1¼ million borrowers, mostly with long-term loans adding up to a balance of about \$30 billion. This imposes a massive task of loan servicing and borrower supervision, even without the annual mounting up of new accounts.

As a final note with respect to farm loan services, we welcome and hope for an ever greater participation by private lenders in programs they can share through the FmHA guarantee. It brings us their assistance in servicing, and makes for less budget impact in an era when inflation is a number-one concern. And it brings into rural areas a great new flow of capital from central money markets not otherwise accessible to the farmer and small community.

PRICE SUPPORT AND INCOME MAINTENANCE PROGRAMS

(By Stewart Smith, Associate Administrator, ASCS, USDA)

The Agricultural Stabilization and Conservation Service (ASCS) is the agency of the Department of Agriculture that has responsibility for administering specified commodity and related land-use programs designed primarily for price support, income maintenance, and to increase price and supply stability. Its principal activities include:

(1) Commodity support operations through loans to farmers, direct purchases of commodities from farmers and processors, acreage set-aside, and other production payments;

(2) Production adjustment to balance supply and demand through cropland set-aside, acreage diversion, and allotments and marketing quotas in some cases;

(3) A reserve program to adjust market supplies to effective market demand;

(4) Farm facility loans; and

(5) Conservation assistance through cost sharing with farmers for certain approved conservation and pollution abatement practices.

All of these programs act to reduce supply and price variability and increase the flow of funds to the farm sector. These funds enter the farm sector through earned income in the marketplace as well as transfers from the public sector through nonrecourse loans and income payments.

COMMODITY LOANS

Commodity loan programs have been in operation for more than four decades. These loans, nonrecourse in nature, are designed primarily to enable producers to withhold commodities from the market until they decide that the price is right or until call of the loans, whichever comes first.

These loans facilitate more orderly marketing and also assist in stabilizing prices and income. At the same time, they provide short-term interim financing on attractive terms. Farmers have increasingly utilized this tool in their production and marketing strategies. For example, during the 2-year period 1971-72, farmers placed 20 percent of wheat, 12 percent of corn, 11 percent of sorghum, 15 percent of barley, and 11 percent of soybeans produced under loan. For the 1977 crop, 29 percent of wheat, 20 percent of corn, 27 percent of sorghum, 21 percent of barley, and 6 percent of soybeans produced were placed under loan.

Latest estimates of dollar outlays for producer loans for 1977 crop wheat, feed grains, soybeans, rice, and cotton total \$5.6 billion. For the 1978-79 crop, loans are estimated to total \$3.9 billion.

THE RESERVE PROGRAM

The reserve program is designed to absorb excess production in years of good weather and release commodities in years of production shortfall; 1976 and 1977 crops of wheat, corn, sorghum, barley, and oats; 1976 and 1978 crops of rice; and 1978 corn are currently eligible for the reserve, provided producers of these crops were eligible for loan or purchase agreements. Loans on grain in the farmer-owned reserve are extended for a period of up to 3 years. This means that farmers can obtain loans for periods of up to 45-48 months, with interest forgiveness after the first year in reserve, that is, up to 2 years of free use of loan money.

As of November 3, 1978, there were 403 million bushels (11 mmt) of wheat, 456 million bushels of corn (11.6 mmt), 40 million hundred-weight (1.8 mmt) of sorghum; 35 million bushels (0.8 mmt) of barley, and 39 million bushels (0.6 mmt) of oats. In total there are 25.8 million metric tons in the farmer-owned reserve.

These reserves currently represent 32 percent of estimated ending stocks. With some further entry of stocks in the farmer-owned reserve and estimated CCC takeover stocks of about 5 million metric tons, total reserve stocks are estimated to equal about 57 percent of ending stocks.

With storage payments of 25 cents per bushel for wheat, corn, sorghum, and barley and 15 cents for oats, producers will receive a total of \$210 million for the year. However, total storage payments will be somewhat larger as grain continues to enter the reserve.

FARM FACILITY LOAN PROGRAM

The loan program to help farmers build onfarm storage was begun in 1949. The program through fiscal year 1978 added 3.34 billion bushels of capacity at a cost of \$1.78 billion. However, almost 30 percent of the increased capacity was added during the past 2 fiscal years. In 1978 alone, 754 million bushels of capacity—23 percent of the program total—at a cost of \$646.4 million was added.

A portion of the increase can be attributed to a liberalization in program provisions. In the spring of 1977, producers were allowed to borrow on the basis of storage needs for 2 years of production; borrow up to \$50,000 and up to 85 percent of the cost of buying and installing storage facilities and drying equipment; and the downpayment was reduced to 0.5 percent of the cost of structures and equipment. The latest change authorizes loans for structures to store high-moisture forage and silage and for remodeling existing storage facilities to increase capacity and efficiency.

A portion of the loan activity can also be attributed to the level of supplies relative to demand. For example, there were relatively large increases during 1968-70 (annual average of 182.5 million bushels) of capacity added; 1972-74 (annual average of 242.1 million bushels).

DEFICIENCY PAYMENTS

Deficiency payments provide income support without interference in the free interplay of supply and demand to determine market price. These payments are a form of income transfer providing funds without any repayment obligations. In years of abnormally good

weather, these payments can result in rather large income transfers to participating producers.

Beginning about December 1, eligible wheat farmers will begin to receive deficiency payments that will total \$585-\$655 million. Barley producers will receive payments of \$65 to \$80 million.

In January, rice farmers will begin to receive deficiency payments of \$80-\$83 million.

In March, corn and sorghum producers will begin to receive deficiency payments of \$225-\$275 million and \$175-\$200 million, respectively. In total, deficiency payments for 1978 crops are estimated to be \$1,130 million to \$1,293 million.

DIVERSION PAYMENTS

Diversion payments for 1978 crops are estimated to total \$474 million to \$548 million distributed as follows: Wheat haying and grazing \$15 to \$20 million; corn, \$400 to \$450 million; sorghum, \$20 to \$25 million; barley, \$9 to 13 million; cotton, \$30 to \$40 million.

Disaster payments could total \$394-\$490 million.

Thus payments—deficiency, diversion, and disaster could provide funds totaling \$1,998 to \$2,329 million for the 1978-79 crop year.

AGRICULTURAL CONSERVATION PROGRAM

This program was started more than 40 years ago offering, at the onset, payments for land use and production adjustments in addition to conservation measures. Later (1944) conservation assistance was limited to measures which farmers generally would not likely carry out to the needed extent unless there was cost-sharing aid. The Food and Agriculture Act of 1977 placed further restrictions on the program. Currently, only enduring conservation and environmental measures which farmers would not carry out without some cost-sharing incentives are eligible for funding.

For calendar year 1977, there were 308,670 participants who received \$175.3 million with an average of \$534 per farm. For fiscal year 1979, the program funds total \$190 million.

COMMODITY CREDIT CORPORATION EXPORT FINANCING

CCC's latest project is combining its export financing facilities with those of the Overseas Private Investment Corporation, which provides loans, loan guarantees and political risk insurance for private U.S. investors in 90 developing countries. This means joint projects that neither agency would undertake alone, and encouragement of U.S. companies with recognized capabilities in agricultural marketing and management to help and expand and improve livestock and processing industries in developing nations. Some of these countries are potentially large markets for U.S. feed grains, soybeans, wheat, corn, and rice.

Export credit program emphasis has been directed to export expansion and to meet foreign competition in sales abroad. The thrust has been for some type of intermediate financing, between the 2 months to 3 years under CCC and the 20-40 year concessional terms under Public Law 480.

Congressional approval of October 14 of S. 3447, the Agricultural Export Trade Expansion Act of 1978, gave CCC intermediate credit authority and more besides. CCC is allowed to provide intermediate-term credit—3 to 10 years—for sales that will expand or maintain the importing nation's market for U.S. commodities or improve its capability to purchase and use U.S. commodities. There are restrictions on this credit, though; the four uses are: (1) grain sales to establish reserve stocks as part of an international grain agreement or other stock building plan; (2) sales of breeding livestock such as cattle, sheep, or poultry; (3) construction of foreign facilities to improve marketing, storage, or distribution of U.S. commodities; or (4) to meet credit competition for export sales. It must be stressed here that the House-Senate conferees stipulated this last usage must be only to respond to credit competition—and not to initiate a credit war.

The Secretary of Agriculture is directed to try and obtain commitments from purchases that will prevent resale to other nations of U.S. commodities purchased with this intermediate-term credit.

Intermediate-term credit sales are exempted from the cargo-preference law provisions.

CCC short-term credit is provided for private exporters of U.S. commodities who offer deferred payment terms to countries eligible for 3 year CCC credit. And the CCC is authorized to provide short-term credit to the People's Republic of China.

OUTLOOK FOR 1979

For 1979 it is expected that commodity price support and income maintenance programs will operate essentially as they did during the current year, that is, set aside, diversion, loan and purchase programs, cost sharing, and CCC export credit. Fund flows to the farm sector will depend upon market prices, which will be determined largely by global demand relative to global supplies, both of which are heavily influenced by weather. Under normal weather conditions, fund flows should be somewhat less than for the current crop, as we would expect ending stocks in 1980 to be somewhat less than those for the current year. CCC export credit currently estimated to total \$1.5 billion could be higher depending upon programing demand under the new agricultural trade expansion authority.

For the 1979 wheat crop, specific program provisions have been announced. These provisions assuming normal weather will result in \$1.3 billion to eligible producers to support prices and maintain income. These outlays are comprised of \$914 million in deficiency payments, \$205 million for disaster payments, \$103 million for loan and inventory, and \$100 million for storage in the farmer-owned reserve.

The 1979 feed grain program will be essentially the same as in 1978. Assuming normal weather, eligible producers will receive \$1.1 billion for price support and income maintenance. These outlays will consist of \$475 million in deficiency payments, \$235 million for disaster payments, \$250 million of diversion payments, and \$189 million for storage in the farmer-owned reserve.

AGRICULTURAL CREDIT DEMAND AND SOURCES OF LOANABLE FUNDS FOR COMMERCIAL BANKS

(By Marvin R. Duncan, Agricultural Economist, Federal Reserve Bank of
Kansas City)

Agricultural bankers in the Middle West and Great Plains—as well as in much of the rest of the Nation—have, within the past year, experienced tight supply situations for loanable funds. A year ago, this was evidenced by unusually high loan-to-deposit ratios and by the decreased proportion of bankers seeking new accounts, as well as by the rising proportion of bankers who are turning down loan requests because of fund shortages. This tightness in loanable funds for agricultural lending seemed to peak during the summer and fall of 1977. At that time, it varied from troublesome to severe in the 10th Federal Reserve district. For example, at least one State was relatively unaffected; while in others, such as Nebraska, the shortage of funds was very apparent.

Events of the past year have brought substantial improvement in farm profitability across much of the Middle West and Great Plains. But, interestingly, only small improvements have been noted in fund availability at commercial banks—as measured by loan-to-deposit ratios. In the 10th district, agricultural banks reported an average loan-to-deposit ratio for October 1, 1978, of just under 64 percent. Not only is this unusually high but it is down only about 1 percent from the ratio reported a year earlier when funds were reported as being very short. Moreover, 68 percent of the bankers responding to the October 1 survey reported ratios of 60 percent or more, compared with 67 percent a year ago. The proportion of banks reporting ratios of 70 percent or more was down about 5 percentage points from a year earlier to 38.2 percent.

Nonetheless, bankers seem to be more comfortable now with these high ratios than they were a year earlier. Only 18 percent reported refusing loan requests due to fund shortages, compared with 26 percent reporting refusals a year earlier. Despite high loan-to-deposit ratios, 57 percent said their ratios were at, or below, desired levels, compared with 48 percent a year ago. Continued improvement in the rates of loan repayments over year-earlier rates were noted by bankers, along with substantially fewer requests for loan renewals or extension. Farm real estate values have turned up again after plateauing for several months, as well; and farm income prospects—especially for livestock producers—are substantially improved. However, some bankers are reporting that paydowns on operating credit lines have not been as prompt, nor as large, as had been hoped for.

Agricultural bankers in the Minneapolis, Chicago, and Dallas districts echo the experience of the agricultural bankers in the Kansas City district. Loan demand remains high, and the average loan-to-

deposit ratios continue unusually high—70 percent for Minneapolis; 65 percent, and the highest ever reported in a survey, for Chicago; and 63 percent, the same as a year ago, for Dallas. Some agricultural banks have increased their use of correspondent bank participations to service loan demands, and a high proportion continues to make referrals to nonbank credit agencies. At this time, however, the use of correspondent bank participations is not as widespread as might have been expected, given the high loan-to-deposit ratios reported by these banks. In the Kansas City district, for example, the proportion of bankers reporting increased referrals to correspondent banks has declined substantially from year-earlier levels.

Some observers suggest that high loan-to-deposit ratios will moderate in the near future as farmers begin to sell the grain and livestock they have thus far held off the market, waiting for improved prices. If this is true, the high ratios may be a temporary phenomenon. Other observers suggest such factors as higher loan limits for State-chartered banks (at least in Missouri), increased competition for deposits, and the need for increased bank profitability—as well as continued strong loan demand—all point to a continuation of the high ratios experienced during the past year. This latter argument seems more compelling.

Many observers have wondered how commercial banks will be able to generate increased amounts of loanable funds to service continued growth in loan demand if these ratios remain high. It seems appropriate, then, to ask what sources of loanable funds—in addition to deposits—are available to agricultural banks and how likely these sources are to be utilized.

An obvious source of funds is the correspondent banking network. Looking at 10th district data, there is little indication that agricultural banks have increased their use of loan participations with regional correspondents. In fact, a larger proportion of country banks now indicate the same, or fewer, referrals to correspondent banks than a year earlier. This seems surprising in light of greatly increased cattle-feeding activity and a marked upturn this past spring and summer in farm implement sales. Minneapolis district data support a conclusion similar to that of the Kansas City district, while Chicago district data indicate a substantially greater use of participations. Data from the Dallas district suggest increased use of participations in some parts of that district. During much of 1978, agricultural banks in the Midwest and Great Plains have shown limited interest in the use of regional correspondents, in loan participations. A question often raised by rural banks—and one that is once again appropriate in light of increased business loan demand and higher interest rates—is whether the regional correspondents will have the funds for use in participations when country banks need help the most. At this time, however, fund availability at a correspondent level does not seem to be a critical issue.

The availability of loanable funds may be related to banking structure, also. In States that permit branch banking, additional funds may be made available to a rural branch bank by the parent bank for seasonal agricultural financing. However, while this can and does happen with some commercial banks with branches, it is not always the case. Available data suggest that, in some instances, loanable funds may also flow from the branch bank to the parent bank. In States where bank holding companies are permitted, or where chain

banking exists, banks quite commonly sell loans to other banks with which they maintain close relations. This practice can also increase the amount of loanable funds available to a single commercial bank.

Directly addressing the question of fund availability constraints, this past summer the Bank of America (B of A) began offering to buy participations in farm loan packages from regional banks under their agricultural loan funding program. B of A proposes to improve the flow of funds within the commercial banking system that are devoted to seasonal agricultural financing. Funds raised in the national money markets would be used to purchase participations no smaller than \$250,000. A regional bank could pool loans from one or more of its country correspondents to meet this minimum size.

This proposal would rely heavily upon the regional correspondent's credit expertise to provide for sale participations in properly documented, creditworthy loans. The originating bank would retain 25 percent or more of each loan, the regional correspondent at least 5 percent, and B of A would participate up to 70 percent on a last-in, first-out basis.

This package has some attractive features for country banks. National money market funds can be marshaled through the commercial banking network, no compensating balances are required, and, since the sales are without recourse, liquidity and balance sheet positions of country banks are improved. Money costs are based upon B of A's 90-day CD rate, adjusted upward for reserve requirements, FDIC insurance, and 360/365-day interest periods. Computed on a 3-month, moving average, this basic cost of funds would be marked up 1.625 percent. The interest rate could change as often as every 30 days.

Thus far, acceptance of B of A's plan has been slow, despite considerable interest. This may be reflective of a number of factors such as increasing certificate of deposit rates and loan interest rates, usury limit constraints in some States, and the reluctance of farm borrowers to accept variable rate loans. It may also be evidence that loanable funds are more plentiful than the available data would lead us to believe.

Agricultural credit corporations formed by commercial banks are another important source of loan funds for seasonal agricultural financing in some parts of the United States. Although interest in such organizations is quite high, apparently no new ones have been formed in the last few months. Loan funds are typically raised by sale of short-term commercial paper (typically 30 to 60 days) in the national money markets and interest rates charged borrowers are adjusted periodically to reflect the cost of funds. In most instances a parent commercial bank will originate the agricultural loans and retain part of the loan. Advantages to banks include access to national money market funds, no reserve requirements, only self-imposed loan limits, and, in the case of commercial paper insured by a private insurance firm, capital requirements are limited to deductible amounts specified by the insurer.

The Agricultural Credit Corporation, formed by the Omaha National Bank, is one of a very small number with insured paper. Insurance coverage—not easy to obtain—is with Aetna Insurance with a maximum dollar amount negotiated annually based on anticipated paper sales. Insured paper is the key for regional banks to tap

the national money markets at competitive rates. Money costs for the Omaha National Bank's subsidiary corporation have been low enough to make its loan costs to the borrower very competitive with other loans at prime plus 20 percent compensating balance. Consequently, loan volume has been increasing, primarily from new customers.

The sale of bankers acceptances to raise loanable funds is sometimes suggested. A bankers acceptance is a time draft, the payment of which has been guaranteed by the bank on which the draft is written. A number of money center banks make limited use of bankers acceptances as a source of loanable funds, especially for financing cattle feeding and grain merchandising. They have the advantage of freeing up capital, avoiding loan-limit problems, and bypassing individual bank constraints. The acceptances are packaged and sold to investors. However, some limitations on the use of acceptances must be recognized. They are sold at discount and typically carry an effective rate of about three-fourths to 1 percent below prime; hence, in many instances, a loan relationship may be more profitable for a bank. An interest rate penalty and a reserve requirement on ineligible acceptances apparently limit the effective market in most instances to eligible acceptances. Only a limited number of major banks have national money market reputations that permit them to successfully sell such paper. This is because buyers of bankers acceptances use them as a short-term money management tool and, consequently, demand a near zero risk of default.

Detailed inventory monitoring is required for eligible bankers acceptances. While acceptances are not suited to loans on growing crops, they are potentially useful wherever inventories are involved. Some researchers have suggested the use of three-party acceptances to raise loanable funds for country banks. A country bank, and city correspondent, would both be acceptors of the paper. Since investors who purchase acceptances would likely not know the reputations and management capabilities of country banks, but would be familiar with major regional correspondent banks, using the regional bank as an acceptor would theoretically enhance the marketability of the bankers acceptance. As yet, however, there appears to be little or no demand for such a three-party acceptance.

Despite limited use nationally of bankers acceptances in agricultural lending, some examples of its use do exist. The American Ag Credit Corporation makes extensive use of acceptances. These loans—primarily in cattle feeding—cover a broad range of agricultural production. The Shawmut Bank of Boston and the Fort Worth National Bank are the major accepting banks, although other banks are also used. This agricultural lender and others using bankers acceptances see an inevitable, but slow growth in their use, limited in part by lack of understanding of the instrument.

The borrower-owned Farm Credit System has, since its inception, offered commercial banks the opportunity to rediscount loans with the 12 district Federal Intermediate Credit Banks (FICB's) either directly or through Agricultural Credit Corporation subsidiaries. During the year ended June 30, 1978, 98 commercial banks or bank-owned subsidiaries used, or had authority to use, this rediscounting privilege. Additionally, 30 affiliates of farmer cooperatives or of privately owned business and privately owned credit corporations were

also eligible for such rediscounting. The majority of eligible firms—70 percent of them—are located in the Wichita, Omaha, and St. Paul farm credit districts.

Rediscounting at the FICB's have never been widely used by commercial banks, however, Commercial banks have typically viewed FICB's and the production credit associations (PCA's) as their competitors and have not been anxious to do business with them. FICB's have frequently been reluctant to service the needs of commercial banks if those banks competed directly with PCA's. FICB's have, instead, often encouraged banks to participate in farm loans with a local PCA. Bankers have generally been reluctant to do this for fear of losing good customers to PCA's. Both FICB's and PCA's have in recent years attempted to establish guidelines that would prevent pirating of commercial bank customers by PCA's under those circumstances.

The ability of FICB's to tap national money markets may be of real value to commercial banks in coming years, however. This could be particularly true during periods of tight money when the traditional correspondent banking system may not provide sufficient fund intermediation. Recent remarks by Farm Credit Administration officials suggest the FICB's may be more open to such cooperation in the future. Only time will tell whether commercial banks wish to fully utilize this source of funds.

There has long been a national resale market for the guaranteed portion of Small Business Administration (SBA) and Farmers Home Administration (FmHA) loans to farmers. Provisions in the Agricultural Credit Act of 1978 should make that market even more attractive to commercial bankers and to investors. Interest rates on the guaranteed portion of FmHA loans are now negotiated between the lender and the borrower. Furthermore, the guaranteed portion of the FmHA loans are now written for a specific term with no graduation—a very important consideration to potential investors.

The Federal Reserve Bank discount window, with the seasonal borrowing privilege, is an important source of funds to support seasonal agricultural lending. For the computation period ended in mid-September of this year, about one-third of all discount window activity in the United States was related to seasonal borrowings. In the important agricultural areas served by the Federal Reserve Banks of Minneapolis, Kansas City, Atlanta, and Dallas, seasonal borrowings ranged from 52 to 87 percent of discount window activity. Despite heavy agricultural lending, commercial banks in the Chicago district made only limited use of the seasonal borrowing privilege.

Seasonal borrowing activity at the discount window has been markedly higher this summer and early fall than during 1977 when loanable funds at commercial banks were perceived to be very tight. For the months of June through September, the average daily borrowing by banks (with up to \$100 million in deposits) was \$133.9 million—up 115 percent over the same period a year earlier.

In summary, if additional loanable funds are needed, commercial banks have available a number of potential sources for such funds. However, some of these sources have been more acceptable to commercial banks and, thus, have better developed intermediation networks. The extent to which each of these sources will be utilized in the

coming years will depend upon the answers to a number of questions Among the questions are:

1. Are currently high loan-to-deposit ratios at agricultural banks a passing phenomenon related in part to delayed marketing by farmers? It seems more likely that higher loan-to-deposit ratios are a new reality for country bankers, due in part to changes in loan limits, competition for funds, and profitability considerations—as well as to loan demand.

2. Can interest rates on farm loans be made more responsive to money market conditions?

In the past couple of decades, some good-sized regional banks have been in and out of agricultural lending a number of times. Variable interest rates, keyed to money market conditions, seem to be an important key to keeping these banks in agricultural lending just as variable rates are a key to successfully tapping national money markets.

3. Are the commercial bank managers committed to aggressively developing agricultural lending? If so, it would seem that greatly increased use will likely be made of the fund intermediation tools previously discussed.

4. Will farmers and their country bankers be willing to provide the types of loan documentation and farm firm financial analysis that regional correspondents, money market banks, and other investors will require, if greatly increased fund intermediation is to occur? And if this is done, will the apparent levels of farm profitability and financial soundness be adequate to attract money market and other investor funds?

Adequate documentation and performance data can be developed and at surprisingly modest cost. Indeed, some commercial banks and most nonbank lenders already require such information. Other presentations at this Outlook Conference should give some indication of future farm profitability. Suffice to it say, if farmers expect to attract new national money market funds into farm lending, they must compete with alternative loan customers—both in price and in risk containment.

WEATHER AND DEALING WITH WATER SHORTAGES

(By Arthur K. Flickinger, River Basins Division, Soil Conservation Service, USDA)

INTRODUCTION

One of the most severe droughts on record in the United States was occurring during the first part of 1977. Not since the Dust Bowl days of the 1930's had the western half of the Nation experienced such persistent and widespread precipitation deficits. The snow packs in the Sierras, the Cascades, and the Rockies were virtually nonexistent. The winter wheat fields of the Great Plains lay barren without the all-important snow cover for the entire winter, and soil moisture supplies at spring planting times were at near-record lows. The northern half of California was in the second year of drought. The outlook for both crops and livestock was bleak indeed.

Fortunately, the circulation patterns that govern the weather over North America began to change during early summer, and by the time major crops were reaching the important stages in their development and growth, small but adequate amounts of precipitation were falling over much of the area that had been drought stricken. Although livestock numbers had been reduced, major crop production shortfalls were thus avoided.

While the West was enduring the rather severe drought, the East was coming through one of the coldest December-January periods on record. The coincidence of the unusually bad weather patterns in both parts of the country lent credence to the gloom-doom-and-disaster predictions of some climatologists.

Other developments that focused public attention on water issues were the controversies over the 160-acre ownership limitation for Federal water project beneficiaries and over the construction of proposed Federal water projects.

With these weather situations fresh in the minds of the citizenry, Congress included the following section in the Food and Agriculture Act of 1977:

Section 1460. The Secretary shall conduct a comprehensive study of the effects of changing climate and weather on crop and livestock productivity and, within 12 months after the date of the enactment of this title, submit to the President and Congress a report together with pertinent recommendations, on this study. The study shall include—

(1) an assessment of current climate and weather conditions in the United States and the possible impact of changes in climate and weather conditions on the Nation's economy and future food and feed availability and prices;

(2) a review of Federal and State water allocation policies; and

(3) a consideration of strategies and techniques for dealing with water shortages in the United States that could occur if current climate and weather conditions continue or become more severe.

Though the drought of 1976-77, which prompted the study, has long since been replaced by floods, blizzards, and tropical storms, the problems induced by climatic fluctuations continue to plague both the producers and marketers of agricultural products. Agricultural problems induced by climate fluctuations are largely those of water shortages. This is not surprising since the major limiting factor in agricultural production for most of the world is water.

Agriculture is the Nation's principal consumer of water and a water management program that does not accommodate the needs for food and fiber production would be meaningless. The study (report) that responds to the congressional mandate is directed only to the agricultural aspects of water shortage. Chapters in the "Weather and Water Allocation Study" are:

Summary.

Water-Short Areas.

Present State of Climate and Its Impact on Agriculture.

Annual Weather, Farm Production and Export Variability—

The Economic Impacts.

Dealing with Water Shortages.

WATER-SHORT AREAS

Water supplies—precipitation and streamflow—are uniform neither by location nor time. Precipitation averages range from more than 40 inches per year in some regions to less than 5 inches in others. Annual streamflows range from more than 150 percent to less than 50 percent of the mean flow in 1 of 20 years. Within a normal year, the ratio of maximum to minimum flows may be greater than 500 to 1.

Agricultural activity adapts to the normal moisture conditions of the climatic regions: Some supplemental irrigation to high value crops in the humid regions, dryland agriculture dependent in large part on stored soil moisture and increasingly on irrigation in the semihumid and semiarid regions, and total dependence on irrigation for crop production in the arid regions.

Water shortages exist wherever water demands exceed supplies. In chronic water-short areas, rechargeable ground water and surface supplies are inadequate even in years of average precipitation. This is the case in much of the arid and semiarid regions. In these areas, demands can be met only by depleting ground water supplies.

Drought is defined as a prolonged and abnormal moisture deficiency. A drought is a water shortage, but since demands may consistently exceed supplies in some areas, water shortages are not necessarily droughts. Every part of the United States has at some time experienced severe or extreme drought.

Federal, State, and local agencies need to improve mechanisms to monitor moisture deficiencies. The mechanism should provide early warning of approaching drought, information on spatial distribution of deficiencies, and a data base to support decisions on emergency funding.

Research and development efforts should focus on monitoring methods—particularly soil sensors to calibrate aerial and modeling measurements—that could provide sensitive indices of drought severity for local areas within regions. Results of more sophisticated moisture deficiency monitoring need to be interpreted and delivered to agricultural users.

CLIMATE CHANGE AND VARIATION

The long-term outlook for climate over the agricultural areas of the United States is by no means certain; however, an examination of the evidence currently available does not indicate any major change in climate for the next few decades. There appear to be two factors that could significantly alter the outlook: Onset of major volcanic activity and the unforeseen effect of atmospheric pollutants on the Earth's climate. Nevertheless, at present the best prediction for the future is that the Earth's climate will be just about the same as it has been for the past century.

The major climatic events to be expected in the future are the year-to-year fluctuations that have characterized climate as far back in history as records can be reconstructed. Thus, the severe droughts of the 1930's and the 1950's will almost surely be repeated at some time in the future; the floods, late frosts, and early freezes that have devastated crops at times in the past will occur again. Similarly, favorable weather like that of the 1940's will again contribute to record harvests.

There is no way that fluctuations in climate can be altered so that they are always a benefit to agriculture; the best means for reducing the adverse effects lie in careful planning and the development of strategies and programs to minimize the risk of catastrophic losses. For this purpose, planners and program managers will require much better information about climatic fluctuations than that now available. This includes information about the structure and likelihood of the fluctuations.

Specific information requirements concern these factors:

- (a) spatial scale or areal extent of climatic anomalies;
- (b) duration;
- (c) amplitude;
- (d) associations between scale, amplitude, and duration; and
- (e) teleconnections between climatic fluctuations in different regions.

One of the fundamental questions to be answered is that of the predictability of the fluctuations. There is a need to settle basic questions about the periodic nature of the important fluctuations.

In addition to the need for better information about climatic fluctuations, there is also an acute need for better understanding of exactly how weather and climate influence agricultural production. Present knowledge of the relationship between crops and climate is vague and is most generally expressed in the form of crude regression models involving gross climatic variables and the yields of major crops such as corn or wheat. The more elaborate models, which require crop development simulations, are impractical for routine use. Unless agricultural policymakers have a thorough understanding of crop-climate relationships, information about climate alone will be of little use in program development or execution.

The U.S. Department of Agriculture in cooperation with the National Oceanic and Atmospheric Administration (NOAA), should begin a major effort to define the predictability, the likelihood, and the characteristics of those climatic fluctuations that have significant effects on crops, livestock, or water resources in rural areas. The National Climate Program Act of 1978 provides the framework for doing this.

The agricultural research program of the Nation's laboratories and universities should expand the effort to establish precise, usable relationships that express the effect of climate and weather on crop and livestock production and on those water resources that support agriculture.

THE ECONOMIC IMPACT OF WEATHER CONDITIONS

The probability that unfavorable weather will result in unprofitable or disastrous yields for the individual producer is high. The typical grain producer is not able to recover the bulk of his production costs 4 out of 10 years. His yield is not enough to recover even out-of-pocket expenses 1 year out of 10.

Government price and income support programs result in both improved market earnings and higher deficiency payments during periods of favorable weather and excess production. Prices go up in periods of unfavorable weather and short supplies, but the effect on aggregate farm income is offset by the price stabilization effect of Government programs and the loss of deficiency payments.

Livestock producers are particularly vulnerable to increases in the price of feed brought about by unfavorable weather patterns.

Considerable uncertainty exists about the extent to which export demand may be affected by global weather patterns. Trade and domestic farm policies of customers and competitors have an important effect on the extent to which demand may be related to world production.

Legislation that USDA has proposed for a farm production protection program should be enacted. The program would offer all-risk insurance protection to all producers and for all crops.

Future farm program legislation and policies should be based on more thorough analysis of the size and distribution of program benefits among producers, consumers, and taxpayers for alternative weather scenarios.

Monitoring of world weather conditions should continue to anticipate factors that might affect the demand for U.S. farm exports.

WATER LAWS AND INSTITUTIONAL ASPECTS

Most of the humid Eastern States that have adopted the riparian doctrine have limited administrative control over water use. Where more and more water is being developed for irrigation uses, States are adopting a permit program or changing to the prior appropriation doctrine to establish State administrative procedures for accounting for consumptive uses (depletion) of water.

Under the prior appropriation doctrine, as adopted by the Western States and a few Eastern States, "beneficial use" is the basis, measure, and limit of the water right. Beneficial use is a subjective delineation

of acceptable efficient use of water. The beneficial use concept of the doctrine is flexible enough for State administrative agencies to maintain strict control of inefficient irrigation water uses and to adjust to changing needs over time.

Gradual changes are occurring in Western water law. For example, beneficial use in several States now includes water for such instream uses as fisheries, wildlife, recreation, and maintenance of water quality.

Many institutions or organizations established under Western State statutes for water resource development and use are limited in their authority, and often changes in statutes are needed to bring about irrigation water conservation. It may be desirable to combine many of the single-purpose institutions into one multiple-use institution to handle irrigation, flood control, ground water management, and other important water uses.

Although State rules of water law define the nature and limit of water rights, the Federal role in water resources cannot be ignored. The Federal Government has proprietary rights, and under the U.S. Constitution, the Congress has the power to regulate navigable waters and any activity affecting interstate commerce, and to act in aid of the general welfare.

States using the riparian doctrine need to design and adopt administrative procedures to enforce the reasonable use aspect of the law through permit systems or other means. States using the doctrine of prior appropriation should maintain the flexibility within the laws to modify the definition of beneficial use to meet public needs and promote water conservation.

DEALING WITH WATER SHORTAGES

Techniques available to deal with shortages

Many techniques used singularly or in combination are available for dealing with water shortages. These techniques can be categorized as follows:

Changing areas and methods of commodity production that result in changed water demands;

Changing time and location distribution of limited water supplies; and

Alleviating hardship caused by water shortages.

Water shortage conditions and strategies

The study addressed five conditions of water shortage: Low precipitation during the growing season, ground water mining, inadequate supplies, extended droughts, and catastrophic drought.

Low precipitation during the growing season

In humid areas, the 30- to 50-inch mean annual precipitation is usually sufficient for crop production. Short droughts for several weeks to several months can be expected in most years. In subhumid and semiarid areas, the 10- to 30-inches mean annual precipitation is normally adequate to support dryland crops and rangeland forage. Seasonal droughts significantly affect production 2 out of 10 years.

Strategies should minimize the adverse effect of periods of abnormally low rainfall during the growing season by improving soil moisture

through conservation, encouraging cost-effective supplemental irrigation, and reducing farmer risk through insurance.

Ground water mining

Ground water withdrawal in excess of natural recharge eventually exhausts the resource, diminishes springflow and streamflow, causes subsidence and fissures, and causes saltwater intrusion into freshwater aquifers. Unless there is adequate recharge capability and water available for percolation at least equal to withdrawals, ground water mining occurs.

Ground water mining that exhausts the economically recoverable resource is particularly significant to irrigated agriculture in arid and semiarid areas of the United States. Agricultural production based on ground water mining cannot be sustained indefinitely. Overdrafts causing lowered water tables, higher lifts, and higher unit energy costs will make irrigation impractical. Inevitably, economic and social dislocations will occur.

Strategies should be developed to prevent rapid exhaustion of the ground water resource and to make the transition to dryland agriculture as smooth as possible by relocating water-using activities such as shifting crops to other producing areas, reducing water use through improved water management and water conservation, and developing ground water recharge.

Inadequate supplies

Conflicts arise where scarce water supplies are not adequate to meet the demands. Water shortages occur when high peak demand, seasonal demand, or annual demand exceeds supplies. Ground water mining over years and reliance on basin imports are evidence of average annual demand exceeding supplies.

Water supply shortages for withdrawal have been identified in 70 percent of the Nation's hydrologic subregions. Streamflows are often inadequate to maintain instream values. Competition for scarce supplies is the greatest in arid and semiarid regions. Nationwide, an estimated 81 percent of all water consumed is for irrigation, and in arid and semiarid areas, water for irrigation often exceeds 90 percent of all water consumed.

Strategies should be designed to conserve scarce water resources by coordinated and comprehensive water and land use planning and improved irrigation management.

Extended droughts

Periods of abnormally low moisture sometimes persist beyond a growing season. Long droughts are least prevalent in humid areas and are most common in arid and semiarid areas. Multiyear droughts exhaust available soil moisture, empty reservoirs, and fail to replenish lakes and streams or recharge aquifers.

Strategies should minimize the adverse impact of extended droughts by gearing livestock and cropping activities to the productive base; for example, livestock management plans, range management, retirement of marginal cropland, use of drought-tolerant plant varieties, soil moisture conserving practices on dryland, erosion-control practices on irrigated land; managing conjunctive water supplies and improving irrigation efficiencies; and reducing farmer risk through insurance.

Catastrophic drought

An extreme moisture deficiency occurring at a time the agricultural condition is weak and the Nation is in economic distress could cause a tragic event ranging from severe socioeconomic disturbance to utter ruin. Although such a catastrophic event is unlikely, the consequences could be devastating.

Drought disaster funding is now arbitrarily based on some empirical meteorological indexes. These are neither universal nor satisfactory measures of the effect of drought on the Nation's agricultural producers. It would be highly desirable to have a drought measure that conveys information about the real effect of drought on production or income.

Drought disaster funding should be sufficiently flexible to accommodate the full range of effects to be expected. Farmers who irrigate crops do not suffer the same losses from droughts of moderate or short duration as do those who engage in dryland farming. Similarly, the effect of a severe drought is vastly different for a corn farmer and a fruitgrower. If the crop is lost, the corn farmer is adversely affected for 1 or perhaps 2 years, whereas it may take the fruitgrower several years to restore a damaged orchard to full productivity.

The strategy should be to monitor moisture deficiencies and to prepare and keep updated a drought contingency plan that outlines action to preserve the productive resource base, to prevent critical food shortages, and to ward off drastic adverse economic effects. The plan should address the degree of drought severity for implementing required actions and authorities.

RECOMMENDATIONS

The Federal Government should take the following actions to better define droughts; conserve water, especially in deficit areas; and to minimize adverse effects of droughts that do occur:

1. Develop consistent standards for measuring and characterizing drought.
2. Improve forecasting of water supplies available for agriculture and other uses.
3. Expand development of drought-tolerant plants.
4. Encourage more widespread use of soil conservation, erosion control, and soil moisture conservation practices. Emphasize that, in addition to higher agricultural soil and water conservation benefits the general public by improving water quality and supply.
5. Encourage producers to develop conservation plans for their farms or ranches that balance agricultural activity with the water and land resource base.
6. Encourage water management consistent with State and regional water plans, emphasizing replenishment of depleted supplies. Determine the most efficient irrigation systems and encourage their use.
7. Encourage public and private organizations that provide water to establish a price rate structure that would discourage excessive water use, particularly for irrigation.
8. Undertake economic analyses to determine the optimal use of national resources—particularly land and water, the most

efficient production techniques, and the optimal spatial patterns of agricultural activities for meeting national food and fiber needs.

9. Establish a national policy that would encourage producers to adopt water conservation measures, set aside land for ground water recharge, preserve wetlands, and provide a rangeland reserve.

10. Determine whether Congress has the regulatory power under the commerce clause of the Constitution to supersede State and local water use laws in the event of catastrophic drought. That power might be used to preserve ground water resources wherever depletion is occurring.

11. Develop a drought-contingency plan to be put in operation if a catastrophic drought is impending. It should be designed under current State and Federal laws to reallocate scarce water supplies, release feed and food reserves, and provide disaster payments to producers and relief to the general public. The plan should include a program for emergency water allocation and should identify congressional power to supersede State laws governing temporary water transfers in acquiring water for redistribution.

12. Maintain a feed and food reserve to guarantee domestic supplies and honor export commitments in the event of an impending catastrophic drought.

AGRICULTURAL WEATHER INFORMATION NEEDS— PRESENT AND FUTURE

(By Dr. Jon F. Bartholic, professor of climatology, Institute of Food and Agricultural Sciences, University of Florida, Gainesville Fla.)

At a Conference on Food and Agricultural Outlook, it is an honor to be able to talk about the single most important factor affecting food production and subsequently, the agricultural outlook. Weather, by nearly any measure, is the most important variable in affecting agricultural production. It is appropriate, because of its significance on agricultural production, that we spend time at this conference examining both present and future agricultural weather information needs.

Agricultural weather and climate affects and change have been increasing in national and international importance during the last decade. Increased weather activities by many Federal, State, and local governmental bodies have become increasingly obvious. The National Climate Act of 1978, recently passed by Congress, provides clear evidence of a gradual solidification of ideas and a national purpose and direction relative to the importance of weather and climate forecasting, and their associated impact.

Much has been said in generalities about weather and its importance. Today, I would like to concentrate on specific agricultural weather information needs. An operational agricultural weather information system has three parts. This paper will concentrate on the three parts and will close with an example that integrates these into a system. The first part of the system deals with weather forecast needs. The second part deals with use of weather forecasts and information to advise agriculturalists of the impact weather will have on their particular area and operation. Third, the present status of dissemination systems which provide weather information and its interpretation to growers or other segments of the agricultural industry, will be reviewed.

WEATHER FORECASTS

The National Weather Service of NOAA has the responsibility for using their models and knowledge of the atmosphere to make forecasts over both considerable time and space scales. The time frames of forecasts available for nearly all areas of the United States are: Special statements of 1-4 hours; routine forecasts for the next 1 and 2 days; 5-day forecasts for temperature, rainfall, and frontal movements; 30-day outlooks for temperature and rainfall; and, seasonal outlooks for 3 months of temperature. Clearly, the usefulness of these forecasts depends upon their accuracy in predicting future weather. Generally, the shorter the forecast period, the higher is the reliability.

In agriculture, all of the time scales of forecasts are needed and, even if they are only relatively reliable, they can frequently be used to provide considerable economic and crop production benefit.

Short-term forecasts are frequently termed "nowcasts" (what is happening presently through the next few to perhaps 8 or 12 hours). The importance of nowcasts will be further explored later in this paper. The technology and reliability is presently available to increase this type of information and forecast.

The other scale of weather forecasting is special. Forecasts are made on a fairly large scale at the national level, models frequently predicting weather information for only several locations in each State. General movements of fronts, high- and low-pressure systems, and large severe weather areas can be forecast at this scale. This information is interpreted by forecast meteorologists at the State level to give more specific forecasts by zones in the State, for areas in the order of 100 to a few hundred square miles. Agricultural forecasts, even within those zones, can be made more specific for critical events, such as freezes. During freezing events, different temperature forecasts for high ground and low ground, which might be cooler areas or areas near lakes, are frequently available.

A special category of forecasts which is important to agricultural and urban needs are severe weather watches and warnings. These can have a special scale of several states, for example, when a hurricane is involved, but frequently are of a much smaller scale as when a tornado or severe rain or hail storm is involved.

USES AND INTERPRETATION OF WEATHER DATA

Our understanding of how weather affects crop growth, yield, disease outbreaks, insect migration, and numerous other areas has continued to improve. The underlying literature which allows information to be gleaned for the development of numerous specific interactions between weather and agricultural weather sensitive operations is now available, as a result of activities of numerous land grant university research programs, and USDA SEA activities and industry, plus research from numerous other developed countries. The importance of soil temperature on planting date has been clearly shown for many crops. Planting at a particular time could be folly if temperatures were too low or there was a forecast for a wet and cooling trend over the next few days. Crop models for predicting growth and yield are available. Models for predicting soil moisture have been used for a number of years. Models for predicting potato blight are used operationally in many areas. The list goes on and on. The bottom line is that it is now possible to take advantage of good weather information and forecasts and to interpret how these will affect various crop production factors. Advice that can be given as a result of the combination of weather forecasts and models can provide growers with information that they can use immediately to make better operational decisions to enhance crop

production and minimize energy usage and possible degradation of the environment. Thus, now is the right time for improving weather information services for agriculture. The interpretation of weather information to provide agricultural advisories or suggestions to operational agriculture is the heart of a total agricultural weather information system. Weather forecast information will continue to be of assistance to the agricultural community. But, it is really the added interpretation by experts of the impact that the weather may have on agricultural operations which has the largest potential for aiding agriculture.

DISTRIBUTION OF AGRICULTURAL WEATHER INFORMATION

Weather information and advice of a general nature is of relatively little value for agricultural use. A grower who is making a decision about putting on an insecticide cannot use information from a forecast that says there is a 30 percent chance of rain this afternoon. He needs digital radar information or satellite data on clouds with a high probability of rainfall and some prediction of the rate and direction of movement of rainstorms. The key for any successful agricultural weather information system is for a grower to have access to the information that he needs for his location and specific needs at a particular time. This point cannot be overemphasized.

Again, as with the state of our knowledge about the effects of weather on agriculture, technology is available for providing an individual in an agricultural operation with specific weather and advisory information at his convenience and for his particular location. This is possible because of the reduction in cost and increased capability of small computers, and improvements in the rapid distribution of data over telephone systems. It is no longer necessary for a large farm operator to have a teletype and get rolls of information on a particular day that he must sort through to find the few specific bits of information he needs. Rather, with computerized systems, a grower could obtain the specific weather and agricultural advisory he needs. A particular grower may only be concerned with a potato crop. Thus, he is not concerned with the disease susceptibility or problems with tomatoes growing on his neighbor's land. The computer-type approach allows for interaction in which the grower can specify not only his area but his particular crop. Thus, he can have access to just the information he needs. The tomato grower next door could also call up and acquire the precise weather, disease, and market information he needs. This approach is in contrast to the general teletype network, the very general information from radio and TV stations, and the repetitive, somewhat general, information even on NOAA weather radio.

GREEN THUMB COMMUNICATIONS SYSTEM

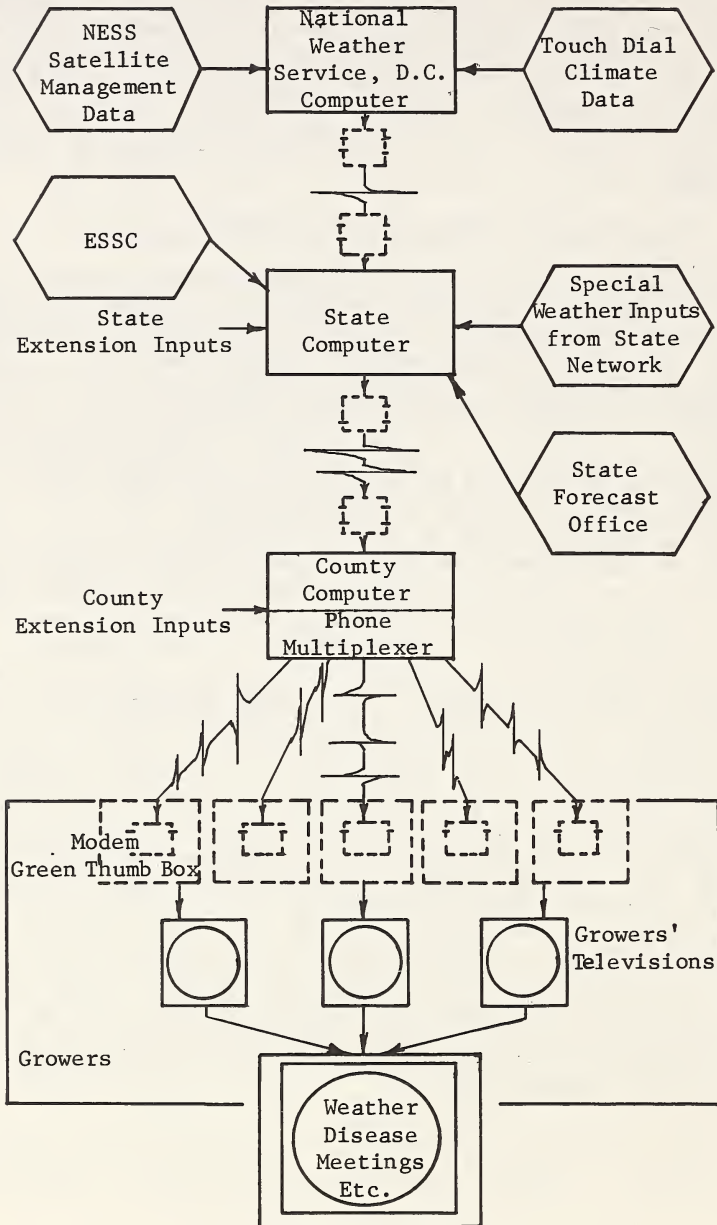


FIGURE 1

A generalized scheme for what has been frequently termed the "Green Thumb System" (a possible system for the distribution of agricultural weather and market information) is outlined in figure 1. The system requires weather inputs and forecasts at the national, State, and local levels and for specialists to interpret the weather information and its possible effects on particular crops and their associated pest problems. Then, at the growers level where the action is, this system allows an individual to select on his home color TV set, the types of weather information and agricultural advisories he needs for his operation. Thus, the grower can acquire from the county computer via telephone lines and his home Green Thumb Box, the specific information he needs to make the best production decisions at his convenience. A prototype of this system is being prepared for evaluation by farmers in Kentucky starting a year from this spring.

NOWCASTING

Nowcasting—forecasts from a few minutes to a few hours in the future—requires all the ingredients of the three areas mentioned above. Because of their short time frame, however, the development of forecasts or other data for nowcasts must be in real time and be used immediately in models or interpreted. Subsequent distribution of nowcast information must also be nearly immediate because of its volatility and importance.

There are two reasons for increased interest and emphasis on nowcasting as an important part of agricultural weather information. First, this is information that a grower can use immediately to make decisions that generally have almost immediate payoffs. For example, if he could receive on his own TV set, an indication of rain clouds, their movement, and relative rain intensity, then he knows whether his farm operations will be affected by that rainfall. He might, for example, stop irrigation or decide whether he has time enough for an insecticide spray being applied to be effective. If there is not enough time for the spray to be effective, then he will stop spraying and thus minimize rapid washoff with the associated danger to the environment. Aircraft application, laborers in the field, haying operations, and nearly every other farm operation are affected significantly by rainfall, temperatures that may be extreme in the next few hours, extremely windy conditions, or a high chance of lightning. Thus, nowcast weather and advisory information have an immediate payoff if it is made available quickly to the agriculturalist.

Second, nowcasting is becoming increasingly important because technologically, this type of information on a fine grid can be made available immediately. In addition, technology is available for distribution of this type of information in visual form to the grower's home TV set. Thus, the need and the ingredients—technical ability—to institute more nowcasts make it needed and technically possible.

A number of examples of nowcast information are now being provided to growers on a test basis. It is anticipated that nowcast information will probably need to be made more and more available to a wider audience in the near future, as these applications grow and their value to the farmer becomes clearer.

EXAMPLE

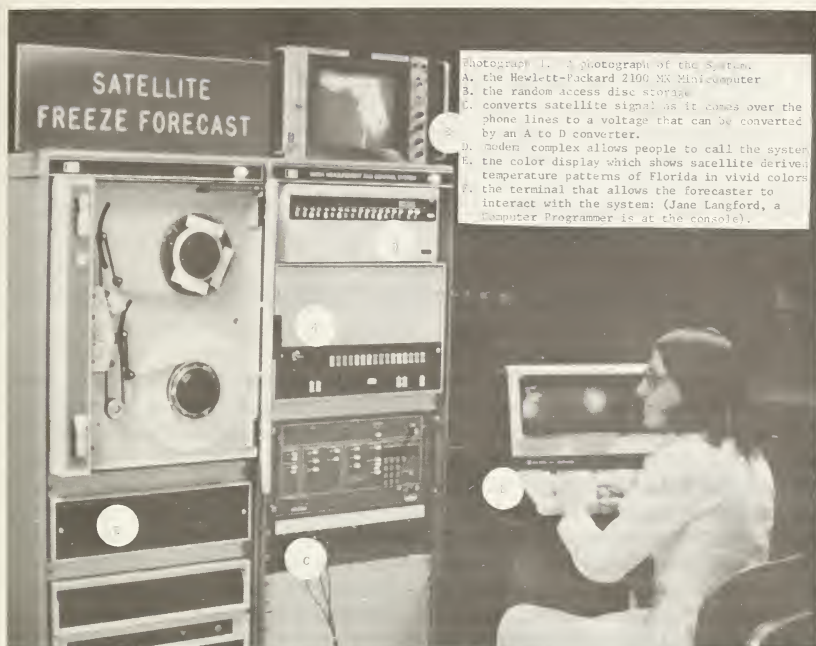
The satellite freeze forecast system has all the ingredients of the three general areas discussed above, that is, (1) Information needs in terms of weather, (2) models, and, (3) distribution characteristics. In addition, because of the nowcasting nature of the freeze information, it provides an example of a nowcast operation. The system was developed in Florida by the author and numerous other scientists with sponsorship by NASA (National Aeronautics and Space Administration) in cooperation with NOAA (National Oceanic and Atmospheric Administration), NWS (National Weather Service), and NESS (National Environmental Satellite Services).

This satellite freeze forecast system requires real time satellite information from NESS and ground truth from a number of airports at other key locations in Florida on an hourly basis. This weather input is then used in physical and statistical models that have been programmed in a small computer system. The information is then used in real time by the National Weather Service forecasters and detailed information is provided through county agents to growers. It is anticipated that information will also be provided to TV and other mass media for distribution to the general public of Florida in the near future.

Approximately 10 percent of Florida citrus, 88,000 acres, are equipped with some type of freeze protection equipment—oil heaters, wind machines, or sprinklers. The cost is approximately \$5 million in fuel and labor if all growers with protection devices activate them for a 6-hour period. Crew standby time during a freeze costs watch approximately \$36,000 per hour. Thus, it is obvious that accurate information regarding freeze severity is very important to growers.

As envisioned at the inception of the project, satellite data would depict contemporary temperature distribution over the State of Florida with a resolution of 25 square miles. The other product would be predictive models of temperatures over Florida in the same color-coded format as the satellite data.

The satellite data product has been fully achieved during the first year of the project. A specially configured computer system was purchased and installed in the National Weather Service Office in Ruskin, Fla., in December 1977 (see photo 1). This weather office has the responsibility for issuing freeze warnings. Satellite data are received in real time, color coded according to temperature distributions, and displayed on a video monitor (see photo 2). The finished product is available approximately 15 minutes after the satellite records the data. The system allows the operator to select portions of the State to enlarge to show additional detail. Satellite data are automatically recorded by the computer each hour. The satellite data gives the forecaster an overview of temperatures throughout Florida in significant detail. It allows him to judge the strength of the cold front as it moves down the peninsula and also shows the rate of movement as shown by successive hourly data.



The second product provides the predicted temperature distribution. This predictive capability involves two computer models. The first model, based on energy balance, utilizes physical data from 12 key data stations located throughout the State to predict temperatures for the rest of the night at those key stations. The second model utilizes the predicted data from the first model, plus statistical coefficients, to provide predicted temperatures for approximately 3,000 additional points throughout the State. These 3,000 points correspond to the 3,000 picture elements (25 square mile spots) that are contained in the depiction of the State of Florida. Thus, the models in combination, will provide color coded predicted temperatures throughout Florida.

CONCLUSION

This is an exciting time for improved agricultural weather information. From a forecasting capability standpoint, and from a knowledge of how to use weather information to aid agriculture view, there is presently a tremendous latent potential. In addition, because of energy, weather changes, increased production costs, and environmental considerations, there has never been a time that there was a higher priority on improving agricultural weather information and distribution. Experiments to provide more and better interpreted weather information to agriculture are aiding greatly in improving agricultural efficiency. All this leads one to have a very optimistic attitude about improved weather information in the future. However, considerable effort, resources, and coordination by agencies at the Federal, State, and local level must continue to improve if the agricultural weather information system is to become a reality.

SOIL MOISTURE IN RELATION TO WEATHER

(By G. C. Bluhm, J. M. Safley, Jr., Program Analysts, and M. W. Meyer, Soil Scientist, U.S. Department of Agriculture)

The elements of weather, temperature, and moisture, control the rate of photosynthesis in plants, the growth rate of livestock, and the productivity of both. Animals are more mobile and, therefore, less susceptible to changes in weather than plants. Therefore, the success of plants in withstanding weather variations is much more critical to crop production, animal survival, and the country's agricultural system. In 1976, world food reserves could only compensate for a single bad harvest year (11). With the need for food increasing yearly, the efficiency and reliability of food production are more critical than ever. To understand optimum crop growth conditions, we must know how weather affects soil moisture and how soil moisture then affects crop response.

A drought is a water shortage; however, since demands may consistently exceed supplies in some regions, not all water shortages are droughts. Every portion of the country has experienced severe or extreme drought at some time. Not until this century have we begun to understand the rudimentary dynamics of weather and climate, and how soil moisture affects crop production. Much work has been done by researchers to put these factors together—weather, soil moisture, and crop yield.

Russell and Danielson (16) reported that mature corn (*Zea mays* L.) used water to a depth of 1.5 meters or more on a deep permeable, well-drained soil.

Bennett et al. (2) found that pearl millet (*Pennisetum typhoides* (Burm.) Stapf & C. E. Hubb), sudangrass (*Sorghum bicolor*), and sorghum (*Sorghum* spp.) extract moisture primarily from the top 61 cm of soil between emergence and the time they achieve a height of 30 cm. By harvest time, they extract water from a depth of 122 cm.

A short period of moisture stress during flowering can considerably reduce the yields of species with determinant flowering. But moisture stress for the same length of time will have only a moderate effect on indeterminate species such as cotton (*Gossypium hirsutum* L.) and soybean (*Glycine max* L.) (17). Robins and Domingo (15) reported that soil moisture depletion to the wilting point for 1 to 2 days during tasseling reduced corn grain yield by 22 percent. Longer periods of depletion reduced yields as much as 50 percent.

Davis and Pallesen (3) did not find a correlation between total seasonal rainfall and corn yield; however, they did find that the distribution of rainfall did affect yield. Soil moisture status prior to silking was critical for optimum yield.

McKinney (9) summarized water use over nine 14-day periods that covered the corn growing season. Water use gradually increased during the first three periods as the plants germinated and grew. Water use

for the next four periods was greatest. During that time, the corn was tasseling, silking, and developing kernels. Use decreased over the last two periods. Kiesselbach (7) found correlations of corn yield with mean season free water evaporation equal to -0.792 . In general, fertilized plants used water more efficiently (7, 13, 14). Denmead and Shaw (4) observed that moisture stress to the wilting point prior to silking reduced corn grain yield by 25 percent; stress at silking stage reduced yield by 50 percent. When the same stress was applied after anthesis, the yields were reduced by 21 percent.

Odell (12) examined how corn yield varied because of rainfall and temperature between May 20 and August 23. Moisture had more effect on yield than temperature. From 36 days before full tassel to 14 days after, temperature and moisture accounted for 67 percent of yield variation. Introducing farming technology as a variable in the regression analysis only, increased the percentage to 75. Letey and Peters (8) found corn yields inversely correlated with soil moisture stress. Yields depended on both the precipitation pattern and temperature. Parks and Knetsch (14) related drought intensity during three stages of growth to the yield of Starr pearl millet. They found that soil moisture status accounted for 95 percent of the variation in yield. Drought days were most prevalent between June and early September during the study. Barger and Thom (1) investigated corn yields in Iowa during mid-May to early September. Rainfall deficits were correlated significantly with lower yields at the 0.1 level for all years of study. For drought years, low rainfall accounted for 25 to 60 percent of the decrease in yield.

Shaw, Runkles, and Barger (17) observed highest correlations between corn yield and water use during the period June 15 to August 1 in Iowa. Average daily water use during this period for the years 1954, 1955, and 1956 was 4.6, 4.6, and 3.8 mm, respectively. Parks and Knetsch (13) used drought indices calculated by weighting drought days to determine moisture stress effects on corn yields. Using drought indices and nitrogen application they accounted for 97 percent of variation among the 15 replicate means. Moisture stress during tasseling was an important source of yield variation. Wallace (18) correlated corn yields in Kansas for the years 1891 to 1919 with temperature and rainfall. He found these factors to be significantly correlated with yields in the months of June, July, and August. Rainfall had a greater effect on yield than temperature did.

Dunlap (5) observed that when cotton wilted for three consecutive days, this caused an appreciable reduction in boll weight. Also moisture stress made squares and young bolls abscise. Shredding was slight early in the season but did increase as the season progressed. In eastern Arkansas, researchers found a high correlation between cotton lint yield and rainfall for the months of April, May, and July. The amount of rain was not as important as its distribution (10).

Howe and Rhoades (6) reported that moisture stress prior to and during anthesis decreased corn grain yields. So did a dry period from silking to full maturity. Corn that was not irrigated used water from a greater depth than did irrigated corn. Nonirrigated corn produced 6.7 bushels per inch of water; irrigated corn produced from 7.0 to 9.2 bushels per inch of water.

From the preceding discussion it is evident that the amount of soil moisture at any one time has a major effect on crop yields. Variations in crop yields can, in turn, significantly affect the Nation's economy.

THE NEED FOR SOIL MOISTURE PREDICTIONS

Soil moisture plays a role in many physical processes on the landscape. A few of the major ones which can be improved by having accurate soil moisture predictions are:

1. *Crop yields.*—Soil moisture is one of the most uncontrolled variables in our major nonirrigated croplands. The quantity, quality, and price of marketable produce depends upon the soil moisture supply. Most moisture stress is caused by a lack of water, but excessive water may also cause stress and reduce yields. Future precipitation is predictable only in a statistical sense but if the soil water status at any time is known, probable yields for the future growing season can be predicted. As data become available, drought and yield assessments could be made on a real-time basis.

2. *Hydrologic predictions.*—Precipitation supplies soil moisture. The amount of soil moisture then largely determines the rate and quantity of infiltration of further precipitation. Soil moisture has a great effect on the amount and rate of runoff. This makes soil water one of the prime variables in flood forecasts, water yield estimates, and hydrologic models. Since soil water affects runoff characteristics, it also affects erosion, chemical transport, and streamflow quality.

3. *Irrigation scheduling.*—Irrigation provides soil moisture for crop production. It makes little difference whether soil water is supplied by irrigation or natural precipitation. Therefore, the same physical processes can be used to determine and predict the amount of available soil moisture regardless of the source. Most people decide to irrigate on the basis of personal experience. Often water and energy are wasted and less than optimum crop production is reached. With scientific soil moisture predictions, they could manage irrigation for the best economic returns with maximum resource conservation.

4. *Farm management decisions.*—Farmers are constantly faced with decisions which relate partly or entirely to soil moisture. The crops they select may well depend upon the soil water content at planting time and how much precipitation they expect. Using scientific soil moisture predictions, they could make better estimates of probable crop yields at planting time.

The number of days the soil can be tilled depends on its water content. This varies from year to year and with location. However, if reliable statistics were developed, they could provide sound guidelines for selecting properly sized machinery and power units to perform tillage operations for the area involved within the allowable time.

5. *Water management and conservation.*—The design of many conservation practices is concerned with how the practice will affect surface water runoff and soil moisture. Examples are mulch tillage, summer fallow, bench terraces, contour furrows, and drainage. Adequate predictions on the effect of altering water transport by these practices would allow better recommendations and economic evaluations to farmers and land users.

6. *Benefit to other disciplines.*—The soil water regime plays an important part in the mapping, descriptions, and interpretations found in soil surveys. Only broad classifications between wet to arid are now possible. But more accurate soil moisture predictions would allow more detailed delineations, with more accurate soil capabilities defined for farmers and other users.

Soil water content affects soil temperature. Therefore, accurate soil water predictions are required before soil temperature predictions can be made. Examples would be predictions of soil temperature and frozen soil which are needed to define planting date and winter soil water infiltration, respectively.

PREDICTING SOIL WATER (DEVELOPMENT OF METHODS)

The predictions of soil water is complex. Even direct measurement is difficult because of variations caused by time, depth, and location. There are no simple measurement methods. One of the best measurement techniques now available involves placing a tube in the soil through which a radioactive, calibrated probe can be lowered. However, this technique provides the water content at only one location at one specific time. You must repeat the procedure many times in different places to arrive at soil moisture status over an area through time.

Many predictive schemes have been tried to avoid measurements or interpolated between measurement times. Most involve correlation or other simple models involving climatic and crop variables. More recent comprehensive mathematical models which integrate the combined effects of climate, soil, and vegetation characteristics are more accurate. The soil-plant-atmosphere-water (SPAW) model developed by Saxton¹ is a recent model of this type and it is now being tested by the Soil Conservation Service (SCS) and others.

National assessment and decisions.—Soil moisture is a natural resource that plays a significant role in our Nation's economy. Because it changes with time and location, it is difficult to easily assess the soil moisture status or its potential impact. However, once a good predictive capability is developed which accounts for the combined effects of climate on crops and soils, Government agencies will be able to maintain a continuous assessment of soil water and crop status. This assessment would allow them to minimize the adverse effects of droughts and crop shortages or excesses. A timely and extensive soil water assessment by Government agencies could save millions of dollars in relief payments and improve crop prediction estimates or national supplies and international trade.

SOIL MOISTURE PILOT STUDY

SCS has a 5-year soil moisture pilot study underway in cooperation with the Extension Service (ES) and Federal Research (FR) Division within the Science and Education Administration (SEA). This study will furnish basic data at specific sites on soil moisture, precipitation, solar radiation, wind, open pan evaporation, crop yields, and soil. Those data will be used to refine the SPAW model so it can be used to predict the extent and severity of moisture deficits and surpluses throughout agriculturally important areas.

Soil moisture monitoring will begin in fiscal year 1979. Only a limited number of sites can be monitored during the pilot study, and they must represent large agricultural areas so the data can be extrapolated. Another requirement is that the data collected must be suited to the soil moisture models used.

¹ K. E. Saxton, Hydraulic Engineer, SEA, USDA, Pullman, Washington.

The Saxton SPAW model estimates a daily soil moisture budget and does not require highly contrasting climatic areas to be tested. Therefore, locations that represent major crop production areas have been selected. SCS has selected one location from each of the following areas: (1) Southeast—corn, cotton, soybeans, grass, (2) West Cornbelt—corn, soybeans, wheat, grass, (3) Central Great Plains—wheat, fallow, grass, (4) High Plains—cotton, wheat, grain, soybeans, grass, (5) Palouse—winter wheat, fallow, grass, (6) Northern Great Plains—spring wheat, fallow, grass, (7) California—dry land wheat or winter barley fallow, (8) East Cornbelt—corn, soybeans, wheat, grass, (9) Northeast general dairy—corn, soybeans, grass, and (10) Northwest Great Plains saline seep—wheat, fallow, grass.

ECONOMIC CONSIDERATIONS IN SOIL MOISTURE PREDICTION

1. *Benefit-cost analysis: soil erosion reduction.*—In the Great Plains during 1976–77, the wind eroded over 49 million tons of soil because of lack of soil moisture or cover. The current nutrient value of a ton of soil is \$3. However, since there is not only a replacement cost at the position of loss but also a deposition problem at the point of impact, a truer value for soil loss would be \$5 per ton. For 1976–77, the losses amounted to \$245 million. If we knew the specific location and intensity of the drought, a significant portion of that loss could have been eliminated. With valid soil moisture information, farmers could have taken corrective measures such as reducing summer fallow, minimum tillage, etc., to protect some of the 7 million acres affected. Reducing wind erosion by even 5 percent would have saved \$12.25 million in erosion damages.

2. *Benefit-cost analysis: optimizing crop production decisions.*—Farmers now make management decisions without sufficient knowledge of spring and growing season moisture conditions and yield potentials. If moisture supply is higher than anticipated, income opportunities may be lost. Planting costs may be lost if moisture is lower than expected. Accurate and timely soil moisture measurements and model forecasts will allow farmers to prepare an optimum crop production plan.

For example, a program to monitor soil moisture and other necessary variables for predictive purposes would cost about \$1.67 million annually for the Great Plains. The Great Plains includes 465 million acres of cropland and rangeland which could be monitored for a mean cost of 0.36 cent per acre, per year. However, if only the 128 million acres of cropland is considered, the cost is 1.3 cents per acre, per year.

A recent analysis of the impacts of water supply forecasting in irrigated areas showed benefits of nearly \$5 per acre for optimizing farm management decisions (SNOTEL Evaluation, SCS Program Evaluation). An estimated additional return of only 5 cents per acre on cropland in the Great Plains through the use of soil moisture data would yield a benefit of \$6.4 million. Given that the total annual amortized cost of the program would be \$1.67 million, there would be a benefit-cost ratio of 3.8 to 1.

CONCLUSION

Water supplies—precipitation and stream flow—are not uniform in spatial or temporal distribution. Because of the uncertainties of climate, land use decisions are, at best, subject to climatic vagaries. The tools exist to remove or, at least, to lessen the impact of those uncertainties.

What are the implications if we do not choose to sharpen those tools? Our food production capacity and the national economy will be impacted. Our programs for world food production and reserves energy, and resource conservation will be jeopardized if we do not integrate into our management schemes what we know about the climatic effects on soil moisture and crop yields.

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WEATHER AND PRODUCTION PROSPECTS: 1979

(By R. E. Felch and J. L. Lambert, Agricultural Weather Analysts, World Food and Agricultural Outlook and Situation Board, USDA)

Generally excellent weather conditions in most of the major grain-producing regions of the world have played a significant role in the bumper crops now being produced in these areas. Will a favorable weather pattern continue into 1979? If accurate and timely long-range weather forecasts were available, it would be much easier to answer this question. Despite the fact that such forecasts are not available it is possible to draw some conclusions about the production potential for 1979. The purpose of this paper is to review the current agricultural weather situation both nationally and internationally, and by adding what is known about the climatological features of various production areas give some preliminary indications of prospects for 1979—particularly for the spring season in the Northern Hemisphere.

The starting point for evaluating the potential for 1979 is to consider recent and current weather events. For example, the rainfall patterns of recent weeks has helped to determine how much soil moisture the corn and soybean crop of 1979 will have available for growth. It has already determined the amount of fieldwork completed in preparation for spring. It has also determined the condition of the winter wheat crop, which in turn will partially impact how well the crop stands up to winter conditions. In this agricultural weather system there has been a certain amount of "inertia" or momentum already in the system.

Soil moisture is a key element in determining production prospects. Outside of the United States, judgments about soil moisture conditions must be very qualitative. Despite the limitation, condition will be expressed in this context throughout this paper.

THE UNITED STATES

General soil moisture.—Figure 1 shows the latest Palmer Index map. The Palmer Index is designed to provide a means for evaluating the scope, severity, and frequency of prolonged periods of abnormally wet or dry weather. It is not always an indication of the current moisture situation relative to plant requirements, but it is an excellent measure of the overall soil moisture situation. It essentially shows the overall "hydrologic picture" which can have very important implications for agriculture particularly in longer term planning. The Palmer Index is also useful because it effectively integrates the effects of the weather over a period of weeks and even months. Positive values of the index indicate that the moisture supply, either from current or antecedent rainfall, exceeded the amount required to sustain soil moisture levels that would be considered normal for the area.

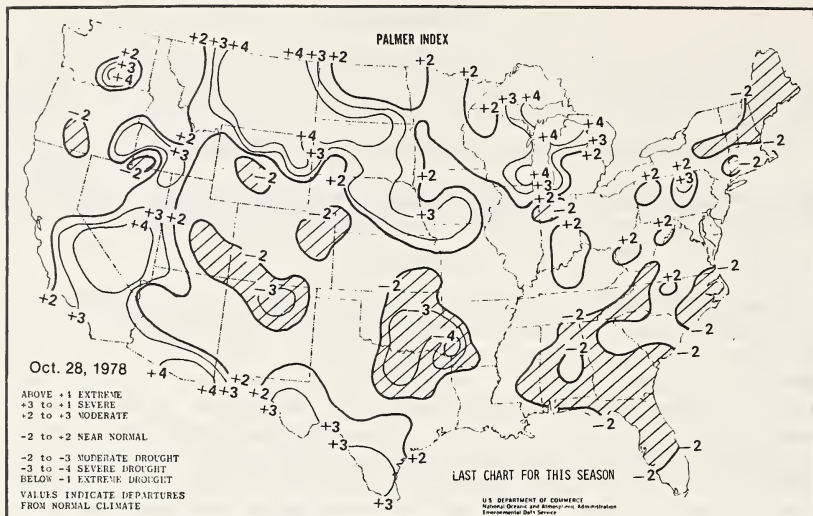


FIGURE 1.—The Palmer Index map for the United States as of October 28, 1978.

Compared to a year ago, conditions east of the Rockies are generally drier with moderate to extreme drought over the southeastern Great Plains and moderate drought over much of the Southeast. Very heavy precipitation last winter has erased the severe drought which had prevailed in the West.

Winter wheat.—Conditions across the entire Winter wheat producing areas of the Great Plains are much drier than a year ago. Winter wheat was seeded under very dry conditions and moisture has been sparse since. During the month of October, precipitation amounts were less than 50 percent of normal over the entire central and southern Great Plains with most of the area less than 25 percent of normal; central Kansas was less than 10 percent. Winter wheat is normally grazed in parts of Oklahoma and Texas several times. This year no significant growing has taken place. In terms of actual soil moisture amounts were generally only 15 percent of normal (1 to 3 inches) across much of Oklahoma as of November 1. Although one significant rain occurred in early November, it is too late in the season for any significant growth. The key question at this time is root development. Will root growth be sufficient to hold the soils and minimize blowing? Reflecting on previous years, this fall is similar to 1975 when conditions were also very dry. With key rains in early spring of 1976 the crop responded and produced an excellent crop.

In general (a) the certainty of adequate moisture for the 1978-79 crop is much less than a year ago and (b) the Great Plains will be very susceptible to blowing. An adequate snow cover will be very important. Conservation practices to minimize blowing will be required extensively.

In the Pacific Northwest, early seeded winter grain is in good condition, but late seeded fields are having difficulty because of dry conditions. The winter rainy season has been slow starting.

Spring wheat.—The primary Spring wheat areas of the Dakotas and Montana have conditions similar to last year at this time with normal to above normal moisture conditions. Soil moisture conditions should not cause any major difficulties for either fieldwork or seeding in the spring based on present conditions.

Corn/soybeans.—The heart of the Corn Belt has enjoyed a perfect harvest season to permit the harvest and storage of bumper corn and soybean crops. October moisture was about half of normal over the western Corn Belt and near to above normal over the eastern portion. Compared to a year ago, when soils were already saturated in many areas, conditions are much drier. However, conditions are still very favorable with actual soil moisture conditions near or above normal for this time of the year.

In general (a) the odds are in favor of a normal planting season across the Corn Belt, possibly a little earlier than usual, and (b) with near normal rainfall patterns soil moisture profiles will be near capacity at the beginning of the growing season.

In the Southwestern parts of the United States, corn and soybeans were hurt by very dry conditions throughout the past summer. These conditions have persisted in the fall. Based on climatology, there is a reasonable chance for some recovery of the soil moisture situation during the winter months. However, springtime moisture will be the key to total recovery.

Other crops.—Dry conditions over the Southeast have kept pasture conditions very poor throughout the summer and fall months. Feed for livestock is in short supply and there appears to be very little chance of significant improvement over the winter months. Even if the moisture pattern should change sharply, low temperatures will minimize any potential regrowth. The best that can be hoped for would be adequate moisture which would prevent the complete loss of the pasture and some buildup of soil moisture in preparation for the warmer spring months.

THE INTERNATIONAL SITUATION

It is impossible to discuss all of the world in the time allowed. However, key situations will be reviewed for the major grain producing regions. These reflect the regions which the Department will be monitoring closely during the coming months through the activities of the joint USDA/NOAA Agricultural Weather Facility. Through the facility, the Department now has the means to monitor weather conditions anywhere in the world on a day-to-day basis.

The U.S.S.R.—The Soviet Union appears to have harvested a record grain crop this year, despite some difficulties early in the harvest season. For the second year in a row winter wheat was sown with favorable moisture conditions—a key element for any good year. Growth of winter grains has not been as great as last year when a warmer than normal November maintained growth much longer than usual. However, overall condition should be good. Two key elements to watch for during the coming months are winterkill and early spring moisture. Winterkill is often very severe in the Soviet Union. Temperature and snow cover conditions must be watched closely. Second, early spring moisture is also necessary for normal to above normal production. While it is not possible to forecast whether favorable conditions will in fact occur, present conditions are such that potential for another good crop still exists.

People's Republic of China.—Broad expanses of central and eastern PRC have experienced a very dry summer. Irrigation systems have permitted the production of reasonable crops this year, but concern must be raised over the potential for problems in 1979. Large portions of Winter wheat area are irrigated and should be in reasonable condition at this time. However, reservoir levels must be reaching lower than desired levels. Wintertime moisture in the PRC is very sparse. Therefore, there is very little chance of significant improvement in the situation between now and early spring when rainfall begins to increase. It can be expected that there could be serious problems with the water supplies for both crops. If the spring months were very dry, it would have serious ramifications for all crops.

India.—Late rains in October caused considerable flooding across much of northeastern India, but this moisture has assured an adequate supply of irrigation water for the coming winter months. Prospects for the winter crops are very good at this time.

Brazil/Argentina.—Our South America counterparts are being watched closely as they move into the harvest of their winter grains and the planting of corn and soybeans is well underway. Very wet conditions have prevailed over Argentina during their early spring months. This has caused some problems in the planting of corn and other summer crops. Wheat harvest has started. Although wheat acreage was reduced because of wet conditions, yields should be excellent based on good moisture conditions throughout the spring months. Brazil has enjoyed generally favorable weather except in the key state of Parana. Rainfall has been generous the past 4 weeks in the surrounding states and the fringes of Parana. Soybean planting has generally proceeded on schedule and the delays experienced in 1977 will be avoided.

Australia.—The winter grain harvest is underway. Rainfall has fallen regularly through the major producing areas. This may be causing some interruptions in harvest activity.

SUMMARY

In reviewing weather conditions around the world, there are no major weather situations at the moment. However, dryness in both the People's Republic of China and in Parana, Brazil are potentially serious and will bear close watching in the coming weeks and months. The major threat to the Soviet Union at the present time is winter-kill—which is a regular feature of their production problems.

Dryness over the Central and Southern Great Plains and the Southeast are the two most serious concerns over the United States at this time. Winter wheat was planted over the Great Plains under drier than desirable conditions. The crop has been struggling to become established before going into dormancy. Soil blowing will be a major threat throughout the winter months unless very careful conservation practices are followed. In the Southeast moisture levels can be expected to pick up during the winter months based on more normal rainfall patterns. However, winter temperatures will prevent any significant recovery of pastures. Row crops will be very dependent on moisture conditions next spring. The Corn Belt is in excellent shape with fall fieldwork well advanced. Odds are in favor of a normal or earlier than normal planting season as opposed to the late season of spring 1978.

COMMODITY OUTLOOK

WORLD SUGAR SITUATION

(By Leslie C. Hurt, Agricultural Economist, Foreign Agricultural Service, USDA)

We can look forward to some improvement in the world sugar situation in 1979. While we will still have an excess overhanging the market, production and consumption will be close to being in balance. Additionally, some of the uncertainties will be eliminated, and the market is likely to get a boost from domestic and international sugar programs.

SUPPLY/DEMAND SITUATION

The world sugar crop for 1978-79 (September-August year) is estimated by the Foreign Agricultural Service at 90.2 million metric tons, raw value. This is 2 percent below the record 1977-78 crop of 92.1 million tons. World consumption for 1978-79 is expected to be at a level of about 89 million tons, which is an alltime high. The increase in consumption reflects not only population growth but a rising per capita consumption in some developing countries. Beginning stocks at the start of the 1978-79 year amounted to about 29 million tons which would represent about 33 percent of requirements for the 1978-79 year. World trade in calendar 1979 will likely show little change from 1978. Imports into the United States will increase, but Economic Community (EC) exports will decline.

Several leading producers, some by design, will have smaller crops for 1978-79. Brazil has set a lower goal and production will decline by about 1 million tons. Approximately one-fourth of Brazil's sugarcane crop will be converted into gasohol as rapid strides are being taken to lessen imports of automotive fuel. Australia has reduced its production by 10 percent and therefore will have a crop of about 3 million tons. The Philippines had a reduction in acreage coupled with heavy rains and typhoon Rita which hit some of the main producing areas in late October. Argentina, EC, and Indian crops will be smaller. Other large producers which will likely have about the same production in 1978-79 as the previous year include U.S.S.R., Poland, Cuba, and South Africa.

The proposal to build the CODESA mill project in Costa Rica has been restudied and reportedly abandoned for economic reasons. Also, plans to produce alcohol in the Tempisque mill for mixing with gasoline for automobiles apparently have been postponed indefinitely. Area devoted to sugarcane in the Dominican Republic is the same this year as last, as sugar prices have made planting very unattractive. The Dominican Republic has begun to reorganize its sugar industry and is attempting to improve the overall efficiency. The Government of Dominican Republic (GODR) and the Venezuelan Government have signed a new agreement in which the former will supply 230,000 short

tons (208,655 metric tons) in 1979 at a reported price of 10.82 cents per pound (CIF). This is the third year in a row in which both governments have signed an agreement on sugar. Sugarcane acreage in El Salvador is expected to drop in 1978-79 from 41,300 hectares to 39,500 hectares. The 1978-79 sugar production outlook for Mexico is for an increase over the record 1977-78 crop. Mexico's sugar outturn is estimated at 3.2 million metric tons. There was an increase in sugarcane area of about 8 percent, and Mexico is expected to meet its export quota under the International Sugar Agreement. Five new mills are to be constructed in the southeast of Mexico which would increase the milling capacity by 500,000 tons—three of the mills are already under construction. Domestic consumption is increasing rapidly, and additional mill capacity is needed to keep pace. A big jump in production will come in Panama where acreage harvested will be up and two new government mills that operated at 50-percent capacity in 1977-78 will be operating at full capacity in 1978-79. The production increase will pose difficulties.

Argentina will have a 2-percent reduction in area planted for 1978-79. The Government has set a sugar production quota of 1,379,000 tons, in order to have the proper balance to conform to International Sugar Agreement quotas. It is expected that 40,000 or 50,000 hectares will not be harvested. Brazil has authorized production of 120 million bags or 7.2 million tons *tel quel* basis (7.6 million raw) for 1978-79. This represents a reduction of practically 1 million tons from 1977-78, and will result in a good balance between supply and demand. Chile will need to import about 290,000 tons in 1979 if stocks are maintained as consumption is increasing and production continues to decline. Export-import activity has been on the rise, with 35,500 tons of refined sugar exported in 1977 and possibly as much as 60,000 tons in 1978. Colombia continues to encourage production in order to supply growing consumption needs and to export. Ecuador is having labor and price problems and the two new sugar mills called for under the Andean Pact regulations are not likely to be carried out in the near future. Effects of drought will be felt again by Peru as their outturn will drop another 50,000 tons in 1979.

The EC is now the world's leading producer of sugar, but is also a substantial importer and one of the largest exporters. Production for 1978-79 will be down from the bumper crop of the previous year, as Denmark, France, and West Germany expect less outturn. Nevertheless exports may approach the 3 million ton mark and the 1.4 million tons will be imported under the Lome Agreement. The EC has budgeted 700 million units of account (over United States \$1 billion) for export refunds on sugar for 1978-79. Only about 180 million units of account are generated by the production levy set on the B quota.

In Eastern Europe no country will have a significant increase in 1978-79. Declines in production are expected for the German Democratic Republic and for Poland. Yields were down in Poland as there were persistent rains and low temperatures during most of the summer. There was also considerable weed infestation and disease. New processing plants are being added at a rapid rate in Yugoslavia (five in 1978), but beet acreage has not correspondingly increased. The U.S.S.R. experienced heavy rains in much of the sugar beet area during harvest time. This deterred harvesting, resulted in an excess amount of mud

on beets harvested and disrupted and delayed transporting and processing. Weather improved considerably after October 9 and efforts were intensified to reach production goals.

There may be slight declines in production in Mauritius and South Africa in the coming year. Substantial increases are expected for Egypt and Kenya, as well as a recovery for Morocco from the low outturn of 1977-78.

The 1978-79 outturn for India is likely to be lower than the record 1977-78 production which surpassed the annual plan of the planning commission. The Government of India has repeatedly appealed to farmers to reduce area, but this has not been done. India decided to decontrol sugar effective August 16, 1978, thereby eliminating all controls on prices, movement, and dual pricing. The Indian Government has moved slowly on sugar exports to avoid huge losses, but has decided to export the entire quota of 650,000 tons allotted under the ISA for calendar year 1978. No new sugar plants are anticipated at present, although there has been some attempt to evolve technology for putting up minisugar plants. Indonesian sugar production is expected to drop by 10 percent, due to heavy rainfall, and import requirements are likely to be up by almost 300,000 tons. Thailand is expected to have a significant increase following the drought reduced 1977-78 production. Japan's 1978-79 production is estimated at about 700,000 tons, and domestic consumption needs will likely be near the same as in 1977-78. This increase in production will result in import requirements being down from 50,000 to 150,000 tons. A 10-percent reduction in production is expected for the Philippines as acreage declined and some of the producing areas were hit by heavy rains and Typhoon Rita just at the beginning of harvest in late October.

Australia has reduced its production goal for 1978-79. This was done to equate production with domestic needs and the export quota under the International Sugar Agreement.

The International Sugar Agreement 1977 began operating provisionally on January 1, 1978. It is too soon to make an assessment of its effectiveness although prices would probably have gone lower without it. The deadline for ratification has been extended until December 31, 1978. Adherence by members to export quotas, stocking of sugar by exporting nations and limiting of imports from nonmembers will enhance the possibilities of the agreement strengthening prices. At the present time a further rise of about 2 cents per pound is needed to reach the minimum of 11 cents (f.o.b. Caribbean port) called for in the agreement.

When the agreement came into effect at the beginning of 1978, the export quotas were set at 85 percent of the basic export tonnages. Due to the prevailing price being below the 11 cents per pound minimum the quotas were reduced on April 24 to 82.5 percent. Allocations from the hardship reserve have been made to El Salvador, Fiji, Guyana, Panama, and Swaziland. Shortfalls, which are not redistributed when the price is below 12 cents, have been declared for Guatemala, Jamaica, and Trinidad. The current quota is 12,570,499 tons, whereas the basic export tonnage is 15,275,000 tons.

The effectiveness of the agreement would undoubtedly be enhanced if it became fully operational. While there are some 38 member exporting countries and 17 importing members, not all of these have fully

ratified. The United States which is the world's leading importer, although one of the leading producers, has signed but not ratified. As the agreement is still on a provisional basis, contributions to the stock fund have been delayed until January 1, 1979. Loans from the fund to stock up to 2.5 million tons of sugar over a 3-year period would be a plus for the sugar market.

The world price reached its 1978 low on July 26 at 6.03 cents and by October the price had risen more than 50 percent to 9.30 cents, which was the high for the year. In addition to the meeting this week in London, another meeting of the International Sugar Council is scheduled in December at which time discussions will take place concerning the stock fund financing scheme and the possible use of sugarcane for the production of gasohol.

U.S. sugar futures were at their lowest level since 1972 in July. The March 1979 contract rallied from a low of 6.55 cents per pound to almost 10 cents a pound by late October. There were probably several factors contributing to this reversal. An increase in world trade could be expected, as the first 6 months of 1978 were particularly light. Part of the price advance was probably a technical adjustment. But prospects for a closer balance between production and consumption in 1978-79 and an increasing likelihood that the International Sugar Agreement would become fully operational strengthened prices. Moreover, reports of needed imports by U.S.S.R. and the People's Republic of China spurred prices in recent months. While the rapid price acceleration is probably over, there will likely be further gains as domestic and international programs are implemented. Limiting the increases, however, are large carryover stocks and the ever present threat of competition from high fructose sirup.

There is some threat to sugar by high fructose sirup. Presently this threat is mainly in the United States as plant capacity in other countries is very limited. Less than one-half million tons is produced in all of Europe, with most production in Belgium, West Germany, Netherlands, Spain, and the United Kingdom. Ireland, Italy, France, and the Netherlands have plans to build plants totalling about 650,000 tons of capacity, while a 100,000-ton capacity plant is being built at Tilbury, England, at a cost of \$50 million. Production capacity for HFCS in the United States by 1985 may total 2.5 million tons, while the rest of the world combined will probably have a capacity considerably less than that. The Food and Agriculture Organization estimates that high fructose corn sirup consumption in the United States, Canada, EEC, and Japan will be 2.5 million tons in 1980 and 3.4 million tons in 1985.

In some countries consideration is being given to converting sugarcane into alcohol for automotive fuel. Brazil has been the leader in manufacturing of gasohol. The supply/distribution system for the 1978-79 season in Brazil has set the quota for transformation into alcohol at the equivalent of 35 million bags of sugar out of a total quota of 155 million bags. This would be equivalent to about 2.1 million tons of sugar, and exceeds prospective exports of 1.92 million tons. The resultant alcohol output would amount to 2.2-2.4 billion liters. Some 150 projects, new or expansion of existing distilleries are to get government and private financing. Most of these will utilize sugarcane as their source of production. Several other countries have expressed an interest in manufacturing gasohol from sugarcane and/or manioc.

Estimated world net import requirements for the year 1979 will approach the 21 million ton mark. Net imports from the free market will probably be about 16 million tons. Purchases by U.S.S.R. from Cuba are likely to be over 3 million tons. Imports and production are increasing in the developing countries and total consumption, as well as per capita use, is on the rise. On a global basis, however, per capita consumption has hovered around 20 kilograms during the 1970's and total sugar utilization has increased mainly because of population change.

The last year of the 1970 decade will not likely see any real dramatic changes in the world sugar situation, but there will be a closer balance between supply and demand and a firmer market.

CENTRIFUGAL SUGAR: PRODUCTION IN SPECIFIED COUNTRIES

[In thousand metric tons, raw value]

Continent and country	1976-77		1977-78		1978-79	
	Beet	Cane	Beet	Cane	Beet	Cane
North America (cane unless otherwise indicated):						
Barbados		113		94		100
Belize (British Honduras)		93		93		115
Canada (beet)	165		149		116	
Costa Rica		195		192		218
Cuba		6,100		7,000		6,500
Dominican Republic		1,222		1,179		1,270
El Salvador		291		293		290
Guadeloupe		91		97		100
Guatemala		517		410		454
Haiti		48		62		70
Honduras		107		150		150
Jamaica		291		300		356
Martinique		14		16		15
Mexico		2,697		3,030		3,200
Nicaragua		224		214		225
Panama		172		175		220
St. Kitts		41		36		40
Trinidad and Tobago		176		180		190
United States continental (beet)	3,534		2,884		3,033	
United States continental (cane)		1,519		1,497		1,449
United States Hawaii		938		988		939
United States Puerto Rico		243		184		184
Total, North America	3,699	15,092	2,993	16,190	3,149	16,085
Total beet and cane	18,791		19,183		19,234	
South America (cane unless otherwise indicated):						
Argentina		1,592		1,661		1,379
Bolivia		267		280		300
Brazil		7,500		8,600		7,680
Chile (beet)	315		123		102	
Colombia		882		916		985
Ecuador		301		295		347
Guyana		332		245		345
Paraguay		56		70		80
Peru		941		850		800
Surinam		7		10		10
Uruguay (beet and cane)	90	35	49	53	60	40
Venezuela		443		389		440
Total, South America	405	12,356	172	13,369	162	12,406
Total, beet and cane	12,761		13,541		12,568	
Western Europe (beet unless otherwise indicated):						
Economic Community:						
Belgium and Luxembourg		714		729		800
Denmark		416		566		489
France	2,974		4,293		3,800	
Germany, West	2,734		3,075		2,800	
Ireland		186		179		190
Italy	1,748		1,364		1,391	
Netherlands		931		890		942
United Kingdom		755		1,003		1,250
Total, Economic Community	10,458		12,099		11,662	

CENTRIFUGAL SUGAR: PRODUCTION IN SPECIFIED COUNTRIES—Continued

[In thousand metric tons, raw value]

Continent and country	1976-77		1977-78		1978-79	
	Beet	Cane	Beet	Cane	Beet	Cane
Western Europe (beet unless otherwise indicated)—Continued						
Economic Community—Continued						
Austria.....	391	-----	475	-----	350	-----
Finland.....	80	-----	75	-----	100	-----
Greece.....	385	-----	295	-----	326	-----
Portugal:						
Azores (beet).....	10	-----	11	-----	10	-----
Madeira (cane).....	-----	10	-----	10	-----	10
Spain (beet and cane).....	1,449	23	1,251	16	1,240	23
Sweden.....	302	-----	343	-----	315	-----
Switzerland.....	83	-----	93	-----	101	-----
Total, Western Europe.....	13,158	33	14,642	26	14,104	33
Total, beet and cane.....	13,191	-----	14,668	-----	14,127	-----
Eastern Europe (beet):						
Albania.....	22	-----	21	-----	21	-----
Bulgaria.....	285	-----	275	-----	275	-----
Czechoslovakia.....	685	-----	900	-----	900	-----
German Democratic Republic.....	600	-----	782	-----	680	-----
Hungary.....	400	-----	438	-----	420	-----
Poland.....	1,801	-----	1,851	-----	1,791	-----
Romania.....	800	-----	609	-----	610	-----
Yugoslavia.....	707	-----	784	-----	783	-----
Total, Eastern Europe.....	5,300	-----	5,660	-----	5,480	-----
Total, beet and cane.....	5,300	-----	5,660	-----	5,480	-----
Total, Europe.....	18,458	33	20,302	26	19,584	33
Total, beet and cane.....	18,491	-----	20,328	-----	19,617	-----
U.S.S.R. (Europe and Asia) (beet).....	7,350	-----	8,825	-----	9,000	-----
Africa (cane unless otherwise indicated):						
Angola.....	-----	50	-----	60	-----	65
Egypt.....	-----	662	-----	634	-----	700
Ethiopia.....	-----	180	-----	150	-----	165
Kenya.....	-----	161	-----	197	-----	284
Malagasy Republic.....	-----	107	-----	110	-----	112
Mauritius.....	-----	731	-----	705	-----	695
Morocco (beet and cane).....	330	7	245	6	325	8
Mozambique.....	-----	200	-----	260	-----	250
Reunion.....	-----	260	-----	265	-----	275
Rhodesia.....	-----	250	-----	275	-----	275
South Africa, Republic of.....	-----	2,166	-----	2,211	-----	2,122
Swaziland.....	-----	209	-----	225	-----	235
Tanzania.....	-----	120	-----	120	-----	125
Uganda.....	-----	30	-----	15	-----	20
Zaire.....	-----	49	-----	58	-----	65
Other Africa.....	(22)	(591)	(29)	(622)	(35)	(623)
Algeria (beet).....	12	-----	15	-----	20	-----
Cameroon.....	-----	22	-----	25	-----	30
Congo (Brazzaville).....	-----	45	-----	40	-----	25
Ghana.....	-----	14	-----	17	-----	20
Ivory Coast.....	-----	30	-----	40	-----	45
Mali.....	-----	15	-----	20	-----	23
Malawi.....	-----	70	-----	80	-----	85
Nigeria.....	-----	55	-----	60	-----	55
Senegal.....	-----	35	-----	25	-----	25
Somali Republic.....	-----	30	-----	30	-----	25
Sudan.....	-----	185	-----	200	-----	210
Tunisia (beet).....	10	-----	14	-----	15	-----
Zambia.....	-----	90	-----	85	-----	80
Total, Africa.....	352	5,773	274	5,913	360	6,019
Total, beet and cane.....	6,125	-----	6,187	-----	6,379	-----

CENTRIFUGAL SUGAR: PRODUCTION IN SPECIFIED COUNTRIES—Continued

[In thousand metric tons, raw value]

Continent and country	1976-77		1977-78		1978-79	
	Beet	Cane	Beet	Cane	Beet	Cane
Asia (cane unless otherwise indicated):						
Burma		120		130		130
China, People's Republic (beet and cane)	700	1,900	870	2,100	900	2,100
China, Republic of (Taiwan)		1,123		768		810
India		6,043		7,720		7,000
Indonesia		1,105		1,000		1,200
Iran (beet and cane)	666	79	580	106	533	150
Japan (beet and cane)	339	226	365	275	420	282
Pakistan (beet and cane)	37	705	56	800	50	750
Philippines		2,750		2,397		2,155
Thailand		2,212		1,584		1,800
Turkey (Europe/Asia) (beet)	1,285		1,082		1,300	
Other Asia	(110)	(283)	(120)	(357)	(129)	(363)
Afghanistan (beet and cane)	10	8	10	10	11	11
Bangladesh		150		190		184
Iraq (beet)	3	10	5	15	5	15
Israel (beet)	60		65		70	
Lebanon (beet)	5		5		5	
Malaysia		38		50		50
Nepal		16		17		18
Sri Lanka		30		35		40
Syria (beet)	32		35		38	
Vietnam		31		40		45
Total, Asia	3,137	16,546	3,073	17,237	3,332	16,740
Total, beet and cane	19,683		20,310		20,072	
Oceania (cane):						
Australia		3,405		3,322		3,000
Fiji Islands		307		369		300
Total, Oceania		3,712		3,691		3,300
Total, beet and cane		3,712		3,691		3,300
World total (beet)	33,401		35,639		35,587	
World total (cane)		53,512		56,426		54,583
World total (beet and cane)		86,913		92,065		90,170

U.S. SUGAR AND SWEETENER OUTLOOK

(By Thomas W. Little and Fred Gray, Agricultural Economists, Economics, Statistics, and Cooperatives Service, USDA)

INTRODUCTION

Congressional deliberations will likely resume in January on sweetener policy issues that were debated in the 95th Congress. Secretary Bergland has indicated the President has agreed to support legislation in the next Congress to provide a domestic sugar program, as well as to provide the authority for the United States to carry out its obligations under the International Sugar Agreement (ISA). Similarly, Congressman Foley, chairman of the Committee on Agriculture of the House of Representatives, has indicated sugar will be among the first issues taken up by the House Agriculture Committee.

Efforts in the 95th Congress to implement the International Sugar Agreement and a new domestic price support program, while unsuccessful, have helped to define policy issues and establish parameters within which national sweetener policy may ultimately be formulated. The debate has also sounded the concerns of the domestic sugar and corn sweetener industries, and focused attention on the U.S. role in the international sugar market.

Until U.S. sugar policy is more clearly defined, congressional review of sugar policy and administrative support decisions authorized under existing law are expected to remain major factors affecting sugar prices and the sweetener situation and outlook. In discussing the current situation and outlook, some of the recent price support program announcements will be reviewed. However, some questions may not be answered. For those, we can turn to the resource panel which is assembled.

THE SITUATION

In presenting our assessment of the current situation, let us focus first on sugar—prices, production, consumption, imports, stocks, and support measures—then move to corn sweeteners, minor caloric and noncaloric sweeteners.

SUGAR

PRICES

Raw sugar.—Since suspension of the reporting of world and domestic spot prices on November 3, 1977, by the New York Coffee and Sugar Exchange in reaction to a suit filed by the Justice Department, it has

been difficult to closely follow movements in U.S. raw sugar prices.¹

During the first half of October, the "derived U.S. raw sugar price"² (New York) averaged 15.20 cents per pound, up significantly from the year's low of 12.63 cents per pound, recorded in July. The average for the first 9 months of this year was 13.87 cents per pound, up significantly—due largely to a higher duty and a new fixed import fee—from the 1977 calendar year average of 11 cents per pound. It is estimated that as much as a fourth of the recent increase in the domestic derived raw price may be explained by the exchange rate of the U.S. dollar relative to the British pound sterling. With a decline in the value of the dollar, the London daily price expressed in U.S. dollars increases. Conversely, strengthening of the dollar will result in a lower exchange rate coefficient, and thus to a decline in the derived New York raw sugar price.

It should also be pointed out that the derived price does not necessarily reflect the U.S. transaction price. Trade sources have indicated that transaction prices at different intervals have been above the derived U.S. raw price, and at other times lower than the derived U.S. raw price. The differential, it appears, reflects expectations of market participants, particularly anticipated price support levels, import fee announcements, and other policy actions.

Wholesale refined.—Domestic wholesale prices of refined sugar have tended to parallel changes in the domestic raw sugar price though this is not easily seen at first glance. For example, the reported Chicago-West list price for refined sugar has remained unchanged at \$18.65 (100-pound bags, or liquid) per hundredweight since February 1978. However, the actual price for bulk dry sugar was reported to be as low as \$16 per hundredweight last summer in some instances. Since then, prices have strengthened in the Chicago-West and other territories.

In the Chicago-West territory, bulk sales are reported to be occurring at levels above \$16.75, while bagged and liquid sugar sales are reported above the \$17.25 level. As raw sugar prices have increased in recent months, discounts under list for wholesale refined sugar in the Chicago-West marketing territory have become smaller. Wholesale price trends in other territories are similar, though the reported discount under list in most areas is reported to be significantly less than in the Midwest.

Retail.—After increasing about 2.5 cents per pound from the December level of 21.6 cents per pound (5-lb. package), the most recent index indicates the U.S. average retail price has been holding around 24 cents per pound since March.

¹ It becomes more and more difficult to adequately analyze and evaluate the domestic price situation as the price data base continues to erode. As indicated, the New York Coffee and Sugar Exchange ceased reporting the domestic and spot raw prices of sugar in early November 1977. A Federal judge recently postponed until December 26, a hearing on whether the exchange can report a domestic price of sugar through the use of a randomly selected panel of market experts. Should a positive ruling be made at that hearing, it would be sometime next year before the reporting apparatus could be put in place.

Beginning in July, the Bureau of Labor Statistics (BLS) ceased reporting retail prices of individual food and beverage items—including sugar and sweetener-containing products—on a cents per pound or cents per unit basis. The switch by BLS in its method of reporting has resulted in a retail price data gap for sugar and sweetener-containing products. We may be able to eventually obtain a few prices, but most categories will be shown in index form only.

² One indicator has been the International Sugar Organization (ISO) daily price, while another is the derived New York price and Caribbean price based on the London spot price for raw sugar. By converting the London spot price for raw sugar to a Caribbean basis, via the exchange rate and transportation rates, a proxy for the world price (Caribbean basis) is obtained. Similarly, by adding to the Caribbean price, freight and insurance charges to New York, plus duties and fees, a derived New York price for raw sugar may be obtained.

Sugar-containing products.—While retail sugar prices in August were about 11 percent higher than in December, increases in retail prices for most sweetener-containing products were up 5 to 9 percent. Many sweetener products increased in the more narrow 5- to 7-percent range from December 1977 to July 1978. Increases for ice cream partly came from higher milk prices. Similarly, increases for retail cocoa and chocolate prices reflect higher cocoa prices.

PRODUCTION

Total.—U.S. production of cane and beet sugar in 1978-79 is expected to total about 6 million short tons (raw value), up about 200,000 tons from the 1977 level, but 800,000 tons under the record 1976 crop. On a calendar year basis, 1978 production will likely total 5.9 million tons, down from 6.1 million tons in 1977.

Sugarbeets and beet sugar.—Sugarbeet acreage for harvest expanded about 4.5 percent this year. Acreage increases were recorded in 15 of the 17 beet-growing States—declining only in California and Wyoming. In California, wet conditions at planting reduced acreage, and early reports suggest sucrose content could be lower than normal.

The 1978-79 U.S. sugarbeet crop is now expected to total around 26 million short tons, up 4.4 percent from a year ago. The Red River Valley is expecting its largest crop ever. The area will likely account for 30 percent of U.S. output, making it the No. 1 area in production. California-Arizona will be the No. 2 area, accounting for 22 percent of the crop. Timely rainfall since planting and favorable growing conditions in most areas is expected to produce an average U.S. yield of 20.5 tons per acre, matching last year's average. The Red River Valley's yield will be around 18.6 tons, a new record, exceeding the area's average yield of the last 10 years by about 30 percent.

Beet sugar production, from the 1978-79 sugarbeet crop, is expected to total about 3.3 million short tons (raw sugar equivalent basis), up slightly from 3.1 million tons in 1977-78. On a 1978 calendar year basis, beet sugar production is expected to total about 3.3 million tons, nearly the same as in 1977.

Sugarcane and cane sugar.—Sugarcane acreage for harvest will likely total around 753,000 acres in 1978-79, down fractionally from a year ago. Acreage for harvest expanded slightly in Florida, Texas, and Hawaii, and declined significantly in Louisiana. A projected average yield at 36 tons per acre is expected to result in a total crop of around 27 million short tons, about the same as a year ago. Indications now are that cane sugar production in 1978-79 may match last year's outturn of 2.68 million short tons (raw value). Production in calendar year 1978 is expected to be about the same as a year ago—2.7 million tons.

UTILIZATION

Deliveries.—Based on the trend for the most recent 12 consecutive months, calendar 1978 sugar deliveries will likely total 10.9 to 11 million short tons (including Hawaii) compared with 11.25 million tons in 1977. With both the 1977-78 and 1978-79 beet crops down considerably from record levels in 1975-76 and 1976-77, beet sugar deliveries are now running 250,000 tons behind last year's pace. Beet sugar deliveries of 2.46 million tons (raw value) for January-September

were down 11 percent from the same period of 1977. For the year, beet sugar deliveries are expected to total between 3.1 and 3.3 million tons, down from the 1977 level of 3.5 million tons.

Cane sugar deliveries of 5.65 million tons for January–September were about the same as for the first 9 months of 1977. Barring unexpected developments, U.S. cane sugar deliveries for calendar 1977 seem likely to total between 7.6 to 8 million tons (raw value).

Per capita consumption.—With the decline in total deliveries and an increase in the population, deliveries for the per capita consumption of refined sugar in calendar 1978 seem likely to total about 93 pounds, down about 2.5 pounds from last year's level. If realized, it will be the lowest per capita level since the 90 pounds in 1975 which resulted from record high sugar prices.

IMPORTS AND EXPORTS

For the first 8 months of 1978, imports totaled 2.74 million tons (raw value), down 18 percent from the same period a year ago. The decline follows record imports in calendar 1977. In December 1977, sugar was being rushed in to beat the imposition of higher duty and a new fee which was to be effective no later than January 1, 1978. With a record high domestic stock level of 4.44 million short tons (raw value) on January 1, 1978, imports in first quarter 1978 were about half to two-thirds the usual first quarter import level.

Based on the trend for the most recent 12 consecutive months, U.S. imports in calendar year 1978 will likely total around 4.2 million tons, in contrast to 6.14 million tons in 1977. This estimate has been revised upward since the pace of imports picked up noticeably during the summer and early fall.

During the first 7 months of 1978, U.S. sugar exports totaled about 10,000 tons—including liquid sugar—dry basis. At this pace, calendar 1978 exports are not expected to exceed 15,000 tons, down significantly from the 20,000-ton level in 1977. A major reason for the decline is reduced shipments to Canada.

STOCKS

On October 1, domestic sugar stocks had been drawn down to 2.03 million short tons, raw value, from nearly 4.5 million tons on January 1. The October 1 level, however, was about 4 percent higher than a year ago. There was little change in refiner stocks from a year ago—about 1.16 million short tons. Mainland cane stocks of around 350,000 tons, were up sharply from nearly 80,000 tons on October 1, 1977. Much, if not most, of the 350,000 tons of mainland cane sugar stocks includes sugar currently under loan to the Commodity Credit Corporation (CCC) which has not yet been redeemed.

Refined beet sugar stocks totaled 512,000 tons on October 1, down nearly 200,000 tons from October 1, 1977. Two significantly smaller beet sugar crops in 1977 and 1978 largely explain the decline in beet sugar stocks.

If a significant change in the recent rate of imports does not occur, calendar 1978 ending stocks will total about 3.5 to 3.9 million tons, down 600,000 to 1 million tons from the record level on hand at the beginning of calendar 1978.

CORN SWEETENERS

PRODUCTION AND CONSUMPTION

The U.S. wet milling grind in calendar 1978 is expected to fall slightly short of 400 million bushels. About two-thirds of the recovered starch will be processed into corn sweeteners, the remainder sold as corn starch and dextrin. Total domestic shipments of corn sweeteners for food use are expected to approach 3.65 million short tons—dry basis—up from around 3.4 million tons in calendar 1977.

While relatively low sugar prices have slowed the increase in corn sweetener shipments this year, high fructose corn sweeteners—HFCS—shipments are expected to be up about 200,000 tons (DB). HFCS shipments in calendar 1978 are expected to total near 1.2 million tons (DB). Glucose corn sirup shipments are expected to total around 2 million tons (DB), up slightly from last year's level. And, dextrose shipments for food use could fall under 500,000 tons (DB).

Per capita consumption of corn sweeteners is expected to total nearly 34 pounds (DB) this year up from about 32 pounds in 1977. Most of the prospective increase will come from HFCS, whose consumption may total 11 pounds (DB) in contrast to 9 pounds in 1977. Conventional corn sirup consumption, it is estimated, will total 18 pounds (DB), up slightly from 1977. Per capita dextrose consumption is again expected to fall below 5 pounds this year, continuing the decrease began in 1976.

Per capita HFCS consumption continues the uptrend begun a few years ago. While per capita consumption of glucose corn sirup stabilized in 1976, it has since rebounded to show a slight uptrend. Conversely, per capita dextrose consumption continues the downtrend begun in 1977. Declining per capita dextrose consumption apparently reflects inroads made by HFCS.

PRICES

Corn sweetener prices increased significantly around midyear. The September HFCS price of \$11.97 per hundredweight—DB Decatur, Ill.—was up 3.3 percent from \$11.27 per hundredweight in June. Glucose corn sirup prices, New York basis, increased nearly 15 percent from June to September—5.6 percent increase from July—while corn sirup prices in Chicago increased 7 to 17 percent. Dextrose prices also increased and were about 5 percent higher in September than in April.

Prices of No. 2 yellow corn averaged \$2.13 per bushel in September, down about 15 percent from the second quarter level. Declining corn prices have helped corn refiners partly offset adjustments in demand, as have increases in byproduct prices. Corn oil is up nearly 8 percent from June, with corn gluten feed and corn gluten meal up nearly 9 percent each. The increase in corn refinery byproduct prices comes from the increase in soybean meal and oil prices with which corn refinery byproduct prices compete.

OTHER CALORIC SWEETENERS

HONEY

Honey production in 1978 will likely total around 250 million pounds, up 42 percent from 1977. Supporting evidence comes from the reported 1978 output of 149 million pounds of honey from commercial producers in 20 States with 300 or more colonies. The U.S. average yield of 74.6 pounds per colony of commercial producers was up about 42 percent from last year, and there was also a slight increase in commercial producer colony numbers.

With U.S. production up sharply this year, U.S. imports are running behind last year's pace. Imports could total about 50 million pounds for calendar 1978, down from 64 million pounds in 1977. U.S. exports appear likely to total around 6.5 million pounds in calendar 1978, up slightly from 1977. If present indications for U.S. production, imports, and exports are about as expected, total domestic disappearance may total around 274 million pounds in calendar 1978, up 14 percent from 1977. Despite a significant increase in available supplies, honey prices have held up well, apparently reflecting increased U.S. demand.

MAPLE SIRUP

U.S. maple sirup production totaled 1.15 million gallons in 1978, down 5 percent from 1977. Two States, Vermont and New York, account for nearly two-thirds of U.S. output. With U.S. production down slightly, maple sirup imports for the first 8 months have increased 8 percent from imports during the corresponding period in 1977.

NONCALORIC SWEETENERS

The National Academy of Science is in the process of sending its report concerning the safety of saccharin to the Food and Drug Administration which in turn will transmit it to Congress. The report is expected to be released to the public early in 1979.

Despite recent uncertainty concerning future saccharin food use, imports for the first 8 months of 1978 totaled 2.3 million pounds, up nearly 21 percent from a year ago. If this pace continues, calendar year imports will likely total between 3.2 and 3.7 million pounds, compared with 3 million pounds in 1977.

THE OUTLOOK

SUGAR

Sugar prices and policy.—In looking ahead to 1979, U.S. domestic sugar policy and ratification of the International Sugar Agreement are expected to be primary factors once again in the sugar market. As already indicated the President and Congress will resume efforts to formulate a domestic sugar policy which will be consistent with the aims and objectives of the International Sugar Agreement. The nature and implementation dates of a new domestic program will be of particular interest to the market.

Should the legislative process fail once again to produce a program which is acceptable to the President, the market will be anxious to know what administrative actions under existing law will be taken to provide support for the 1979 crop—which will already have begun to be harvested in Hawaii and Puerto Rico. Under existing statutes the President and Secretary may take actions to adjust import fees, to change the currently nonrestrictive import quota, to maintain a price support loan program, to make purchases of sugar in the market, or to reinstitute a payments program to provide support for the 1979 and later crops.

With the U.S. raw price now in the neighborhood of \$15 per hundred-weight, wholesale refined sugar prices can be expected to rise and maintain current differentials. Retail prices can be expected to increase as well, though increases will likely lag wholesale price changes. Next year we can probably expect retail prices to reflect the 1.5 cents increase in this year's price support level. Prices of sugar-containing products will likely average slightly higher in 1978, reflecting among other things, higher sugar costs. The amount of increases will depend on the volume of sugar in each product, manufacturing costs, prices, and competition.

RECENT SUGAR LOAN PROGRAM ANNOUNCEMENTS

On October 25, Secretary Bergland announced that steps are being taken to support the market price of 1978 crop sugar at 15 cents per pound, raw value basis. In his announcement the Secretary indicated that the import fee may be revised to keep domestic raw cane sugar prices from falling below the 15-cents-per-pound level.

With a market price of 15 cents or more, growers and processors will evaluate whether or not to move their crop to the market or place their 1978 crop sugar under loan at regional loan rates which provide a national average support rate of 14.73 cents per pound for raw cane sugar and 16.99 cents per pound for refined beet sugar. If freight and other charges when deducted from the market price, result in a return from the market which is less than the return based on recently announced regional loan rates, CCC acquisitions could increase. On October 20, 1978, CCC had under loan 503,000 tons of 1977 crop sugar—raw value basis—of which about 350,000 were cane sugar, plus 182,000 tons of 1978 crop sugar, raw value.

The Secretary also announced on October 25, that regular consultations would be begun with Customs officials to establish a monitoring system for sugar imports from countries not party to the International Sugar Agreement to assure that imports from nonmember countries do not exceed levels permitted by the ISA. In so doing the Secretary restated the administration's "strong commitment" to ratification of the ISA.

On October 25 the 1977 loan program was also amended to authorize the payment by CCC of costs incurred by processors relocating, prior to maturity, 1977 crop sugar intended for forfeiture on maturity. This action was taken to make sure that onsite storage is available for new crop sugar. And on November 1, the Secretary called for comments on a proposal to extend the loan maturity dates for 1977 crop sugar. These actions were taken to help assure that market price ob-

jectives would be met, and to reduce the likelihood of CCC takeover of stocks as loans mature.

Production.—Domestic sugar production in 1979 is expected to decline slightly from this year's prospective outturn of 6 million tons—raw value. The first official indication of the next year's beet crop will come in the January "Prospective Plantings" report, and the first indication of sugarcane acreage will be the quantity of seed cane planted in 1978, which will be reported in the January "Crop Production—Annual."

Sugar beet, sugarcane, and corn farmers can expect higher input costs in 1979. Depending on the mix of inputs overall production costs could increase from 5 to 7 percent. Of the major inputs, interest rates will probably show the largest rise. Increases are also expected in taxes, wages, farm machinery, trucks, and energy. Fertilizer prices are expected to increase very slightly. Next year's beet crop will, however, reflect a combination of grower profit expectations for beets relative to other crops, processing capacity, beet contracts, and expectations with respect to longer term U.S. policy and sugar prices.

With record sugar beet yields in the Red River Valley the past 2 years, the area's sugar beet crop has taxed the capacity of processing plants and increased the risks of heavy beet losses in the spring. To reduce these risks, it has been reported that, with favorable spring planting conditions, the area's sugar beet acreage may be reduced 6 to 8 percent. With unfavorable planting conditions, acreage may be maintained to assure an ample supply for processing facilities.

Sugarcane acreage for harvest in 1979 is largely planted. However, sugar production can still be affected by (1) fertilizer application and cultural practices, and (2) weather. At present, next year's cane sugar crop is not expected to differ significantly from the 1978-79 prospective level of nearly 2.7 million short tons—raw value.

Consumption.—Sugar deliveries in 1979 are expected to total about 10.9 million short tons—raw value. With population expanding and total utilization relatively stable a decline in per capita sugar consumption of nearly 1 pound, to 92 pounds per capita, is anticipated. Total use in beverages could increase from this year's level if soft drink consumption bounces back from this year's slower growth rate of about 3 percent. Another factor which could sustain or contribute to a slight increase in use is the canned fruit pack. It will probably be larger than in 1978. However, higher sugar prices could stimulate increased use of HFCS, at the expense of sucrose in the fruit pack.

Imports and stocks.—Imports of foreign sugar in 1979 are expected to total around 5 million tons. In arriving at this estimate, it was assumed that 1979 beginning and ending stocks will total about 3.7 million tons; that production in calendar 1979 will total about 5.9 million tons, and that consumption will total about 10.9 million tons. Imports from Puerto Rico are expected to total from 75,000 to 100,000 tons. Variations in production, consumption, or stock levels will affect 1979 imports. A review of recent year ending stock values shows that a value of 3.7 million short tons, raw value, would be about equal to this year's projected stock value, about 800,000 tons lower than last year's stock level, and about 200,000 tons above the 1977 stock level. Increases in domestic stock levels in the last 3 years have been associated in part with increased risks, large world crops, low prices, and anticipated changes in the level of the import fee.

CORN SWEETENERS

The wet milling grind is expected to total over 400 million bushels in calendar 1979. Dextrose shipments are expected to approximate 1978 levels. Glucose corn sirup sales could top 2 million short tons (dry basis), up slightly from this year's prospective level of 2 million tons. If present trends continue, HFCS sales in 1979 appear likely to total between 1.3 million and 1.5 million short tons. The present consensus is that HFCS shipments next year will likely total near the midpoint, 1.4 million tons.

High fructose corn sirup prices are expected to continue to be largely determined by the price of sugar, since HFCS and sugar are close substitutes in many industrial uses. With slightly higher sugar prices and abundant corn supplies expected through most of 1979, returns in the wet milling industry may improve. Still, competition in the HFCS market is expected to remain keen since production is significantly below capacity.

At present, there is reported to be little excess processing capacity for corn starch, dextrose, and glucose corn sirup, even though abundant HFCS capacity exists. This suggests that prices of corn refinery products other than HFCS are likely to increase in 1979, which may stimulate the building of additional capacity for starch, glucose corn sirup, and possibly even dextrose. Whether HFCS prices will increase much next year is not yet certain. With prices of corn refinery products other than HFCS expected to show some strength and sugar prices higher, HFCS prices may also increase.

U.S. AND WORLD COTTON OUTLOOK

(By Samuel Evans, Agricultural Economist, Economics, Statistics, and Cooperatives Service, USDA)

A year ago, the U.S. cotton industry was looking at sharply falling prices due principally to an anticipated one-third larger 1977 crop over 1976 and the likelihood of the largest supply in a decade. Spot market prices for Strict Low Middling (SLM) $1\frac{1}{8}$ -inch cotton had fallen from 78 cents a pound in March 1977 to 48 cents that November.

This year we have seen rising raw cotton prices, primarily as a result of deterioration in production prospects in the United States, the U.S.S.R., and the People's Republic of China (PRC). Spot market prices have risen about 16 cents a pound since the first of the year, to about 66 cents a pound in early November (fig. 1).

On the demand side, U.S. cotton export prospects are a bit brighter than a year ago, while mill use prospects are definitely gloomier.

In contrast to last year, we see a pronounced reduction in U.S. cotton stocks during this season and a moderate reduction in foreign stocks as well.

Let's now look in detail at the forces behind this dramatic reversal in the cotton outlook from a year ago and, also, at what is likely to happen in the coming year, both here and abroad.

U.S. SITUATION AND OUTLOOK FOR 1978-79

Overview

We began this season on August 1 with cotton stocks of 5.3 million bales, up about $2\frac{1}{2}$ million from a year earlier. Based on October 1 conditions, the 1978 crop was placed at 10.9 million bales, $3\frac{1}{2}$ million below the 1977 crop. But, with the large beginning stocks, supplies are down only about 1.1 million bales from last season. On the demand side, combined mill use and exports are expected to just about equal last season's 12 million bales. So, stocks next August could be worked down to around $4\frac{1}{2}$ million bales (fig. 2 and table 1).

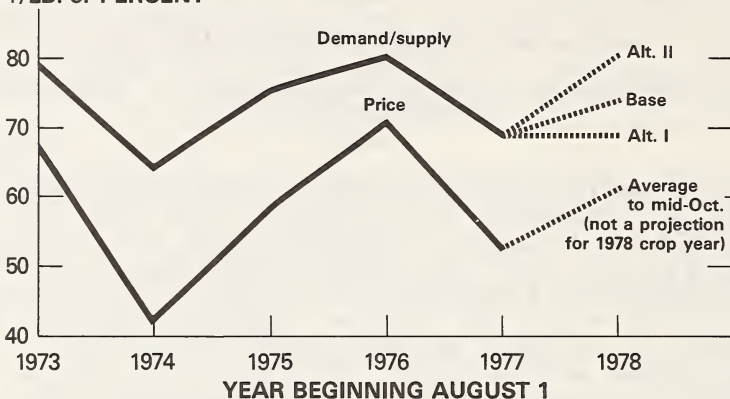
Now, let's turn our attention to the individual items in the U.S. cotton balance sheet.

Production down sharply

The October 1 estimate of 10.9 million bales for the 1978 cotton crop was about 1 million bales below August 1 indications. The smaller estimate reflects adverse growing conditions, especially in the Texas High Plains and in California. Average yield in Texas and Oklahoma was estimated at 278 pounds per harvested acre, compared with a 348-pound average for the previous 5 years. In the Far West, the estimated average yield of 827 pounds per acre was 150 pounds below the 5-year average. Average yields in the Delta and in the Southeast were in line with averages of the last 5 years, but were

COTTON: SUPPLY, DEMAND, AND PRICE

¢/LB. or PERCENT



MILL USE PLUS EXPORTS DIVIDED BY TOTAL SUPPLY FOR CROP YEAR. CROP YEAR AVERAGE, SLM 1-1/16", SPOT MARKET.

USDA

NEG. ESCS 3161-78 (10)

Figure 1

down an estimated 14 percent in the Delta and up by an estimated 35 percent in the Southeast over last season.

Overall, the national average yield per acre was estimated at 425 pounds, the smallest since 1957, and 55 pounds below the average of the previous five crops (fig. 3).

I might add that U.S. cotton producers planted about 13 million acres in 1978, down 0.7 million from 1977. The Southwest and West, together, accounted for 71 percent of total acreage, compared to 68 percent last year and an average of 57 percent during the 1967-76 period.

TABLE 1.—U.S. COTTON SUPPLY AND DEMAND (ALL KINDS)

[In millions of 480-lb bales]

Item	1977-78 preliminary	1978-79 projected ¹		
		Base	Alternative I	Alternative II
Beginning stocks.....	2.9	5.3	5.3	5.3
Production.....	14.4	10.9	11.5	10.3
Total supply.....	17.3	16.2	16.8	15.6
Mill use.....	6.5	6.3	6.5	5.9
Exports.....	5.5	5.6	4.8	6.4
Disappearance.....	12.0	11.9	11.3	12.3
Ending stocks ²	5.3	4.5	5.7	3.5

¹ Base reflects October cotton production estimates. Alternative I reflects higher U.S. production and weaker export demand; alternative II reflects lower U.S. production and stronger export demand.

² May not equal supply less disappearance, primarily due to varying bale weights.

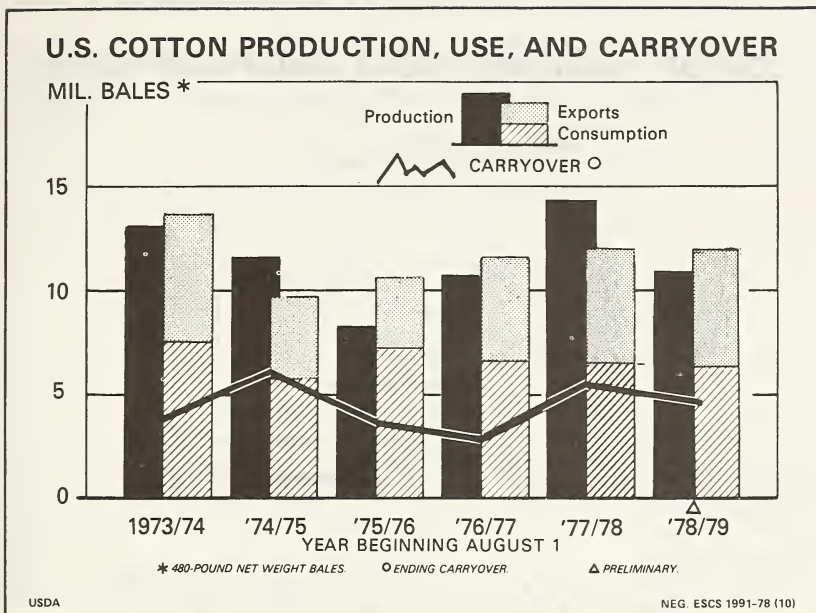


Figure 2

It is also interesting to note that of the projected 25-percent reduction in cotton production this year, only about 5 percent was planned (reduction in planted acreage). If "normal" or higher yields had been realized for the 1978 crop, the overall U.S. cotton outlook for 1979 would be quite different from what it is today.

Mill use down slightly

During the first 2 months of the current marketing year, U.S. mills consumed cotton at only a 6.1-million-bale annual rate, compared to 1977-78's 6.5-million-bale total. And, September marked the 10th consecutive month in which the seasonally adjusted daily rate of use was below a year earlier (fig. 4).

Mill use during the remainder of this year and in 1979 will depend upon (1) the strength of the U.S. economy, (2) relative prices of cotton and manmade fibers, (3) the level of textile imports, and (4) the effects of the proposed OSHA cotton dust regulations.

Dr. Arlie Bowling of the National Cotton Council will be discussing the impacts of the proposed dust standards later in this session. So, I'll confine my remarks to the first three factors, noting that concerns about the dust standards can have only a negative effect on cotton use.

Textiles and the economy

As figure 5 indicates, textile mill activity is highly related to general economic activity, measured here by the index of industrial produc-

COTTON: ACREAGE, YIELD, AND PRODUCTION

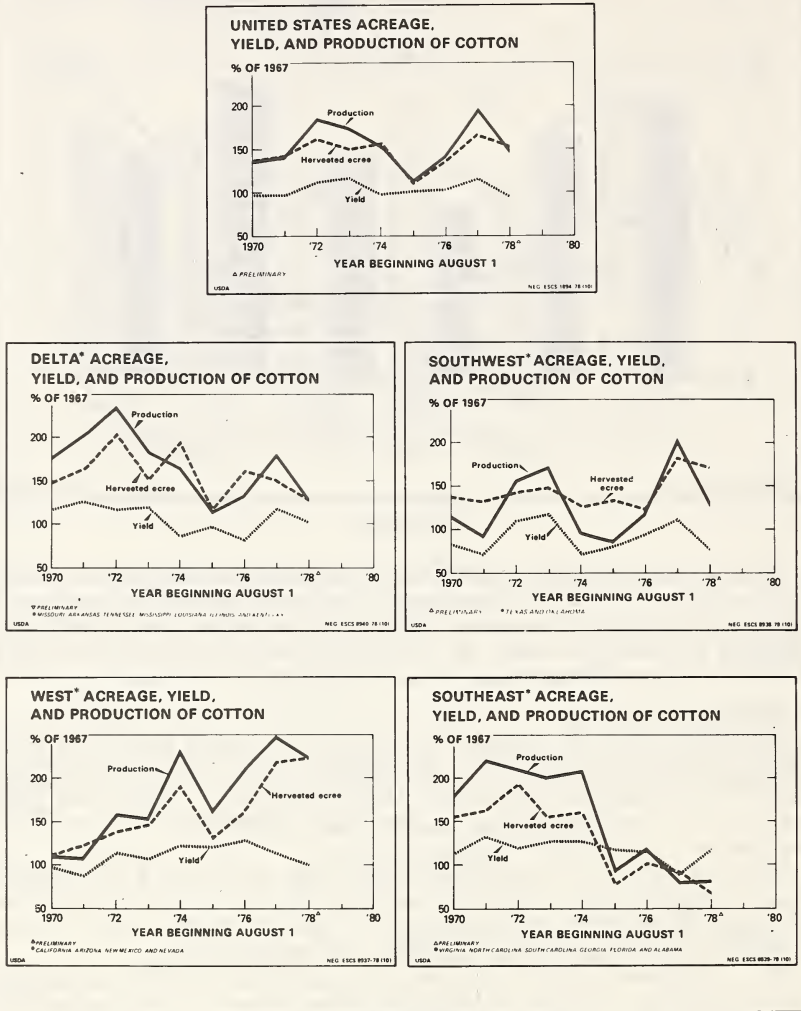


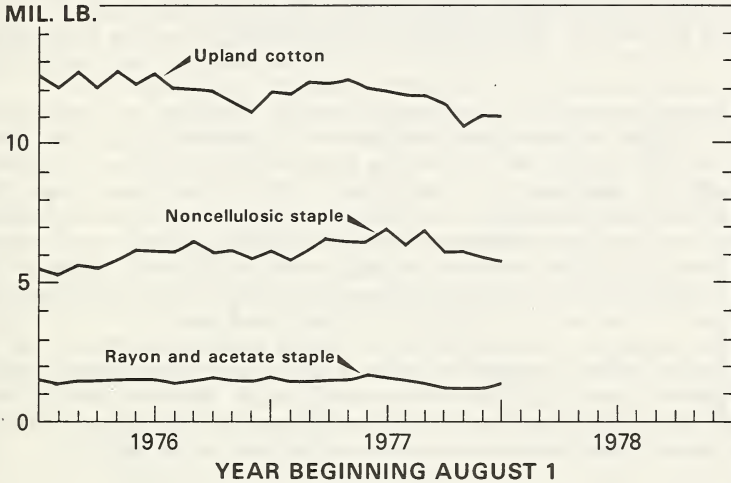
Figure 3

tion. The index through September had increased about 5 percent from 1977 and, in general, textile business has been fairly strong. Through the third quarter of this year, mill consumption of all fibers was about 3 percent greater than during the same period last year. For the year, U.S. mills could use $12\frac{1}{2}$ billion pounds of natural and manmade fibers or about 57.2 pounds per person. These figures compare with 12.2 billion pounds total and 56.2 pounds per person in 1977.

Manmade fibers are benefiting most from the improved textile climate in 1978. Mill use of these fibers is estimated to have increased by about 6 percent from 1977 and their market share to about 75

percent. In contrast, cotton use during calendar 1978 is estimated to have fallen by over 4 percent. Cotton's share of the fiber market is estimated at a record-low 24 percent for 1978, down from 26 percent in 1977.

DAILY RATE OF U.S. MILL USE*



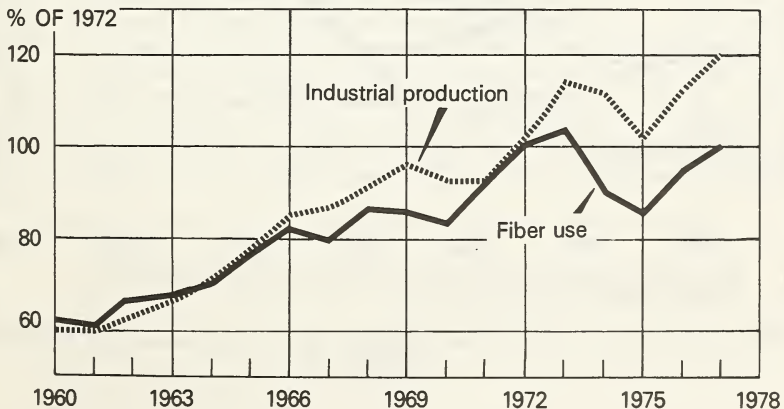
*SEASONALLY ADJUSTED, ON COTTON SYSTEM SPINNING SPINDLES.

USDA

NEG. ESCS 2261-78 (10)

Figure 4

U.S. PER CAPITA FIBER CONSUMPTION AND INDUSTRIAL PRODUCTION



USDA

NEG. ESCS 3156-78 (10)

Figure 5

Denim production down; textile imports up

Two factors are primarily responsible for cotton's poor showing over the past few months. First of all, although demand for many cotton products has been strong, production of denim and some other heavyweight woven apparel fabrics has been at greatly reduced levels since last fall. This is a primary cause of cotton mill use running at the low 6.1-million-bale annual rate this summer. Over the past year, there has been a strong correlation between monthly rates of cotton denim production and mill use. The number of looms running all-cotton denim is currently about 40 percent below a year earlier. And the number of looms running cotton blends is off by one-half.

A second reason for the recent slowness in cotton mill use is that cotton textile imports have been at record levels. During the first 3 months of this year, the raw cotton equivalent of imported textiles was 1.23 million 480-pound bales. This is 31 percent more than was imported during the same time period last year. The cotton equivalent of our textile imports amounted to about 25 percent of domestic cotton mill use during the January–August period of this year. I might add that cotton's share of textile imports so far this year is over 50 percent, compared to a one-fourth share of domestic mill use.

Data are not yet available on textile export quantities. In the first half of 1978, though, the dollar value of our cotton textile exports was down 9 percent from last year. I think that our textile trade deficit could range from 1.0 to 1.3 million equivalent bales of cotton this year, a record even at the lower end of the range (fig. 6).



Figure 6

The declining value of the U.S. dollar has had only a marginal impact on our cotton textile trade deficit. In the last year, the dollar has not changed significantly in value relative to the currencies of our major suppliers of cotton textiles, with the exception of Japan. And, on a yardage basis, even Japan's exports to the United States are higher than in 1977. Also, there is little evidence that U.S. textile exports have benefited from the weakened dollar.

The leading source of our cotton textile imports continues to be Hong Kong with the PRC in second place this year. Last year the PRC ranked as the fifth leading supplier of our imports.

Cotton prices higher

As figure 1 indicates, cotton prices over the last several years have been highly sensitive to changing supply/demand balances. This year is no exception. Spot market prices of SLM 1½-inch cotton have risen about 16 cents a pound since the first of the year and about 9 cents from midyear, and farm prices have risen about 10 cents a pound since January. Mills are now paying about 25 percent more for cotton staple than they are for polyester and 14 percent more than for rayon staple. A year ago cotton was priced lower than the competing manmade fibers (figs. 7 and 8).

Our research indicates that cotton mill use in the short term is highly insensitive to changes in relative fiber prices—a 10-percent increase in the cotton to polyester price ratio could cause about a 2-percent reduction in cotton mill use over the course of a year. Therefore, while high and variable cotton prices are certainly harmful to the level of cotton mill use, I think that over the course of the next few months changes in general economic activity, denim production, textile imports, and reaction to the dust standards will be more important in determining the level of cotton mill use.

Mill use wrapup

For 1978-79, U.S. mill use could range from 5.9 to 6.5 million bales, with 6.3 being the most likely level. To achieve this estimate, the annual rate of monthly mill use has to average about 6.35 million bales during the October-July period, compared to a 6.1-million-bale rate during the first 2 months of the marketing year. Recent improvements in denim production indicate that this is possible. For the week ending October 14, the number of looms assigned to all cotton denim production was up about 10 percent from September 1, and improvement in the ratio of unfilled orders to inventories was also evident.

Along with expected improvement in heavyweight cotton fabric production, continued economic expansion is needed for mill use to reach the upper end of the projected range. On the other hand, a slowdown in the economy could cause mill use to drop below 6 million bales.

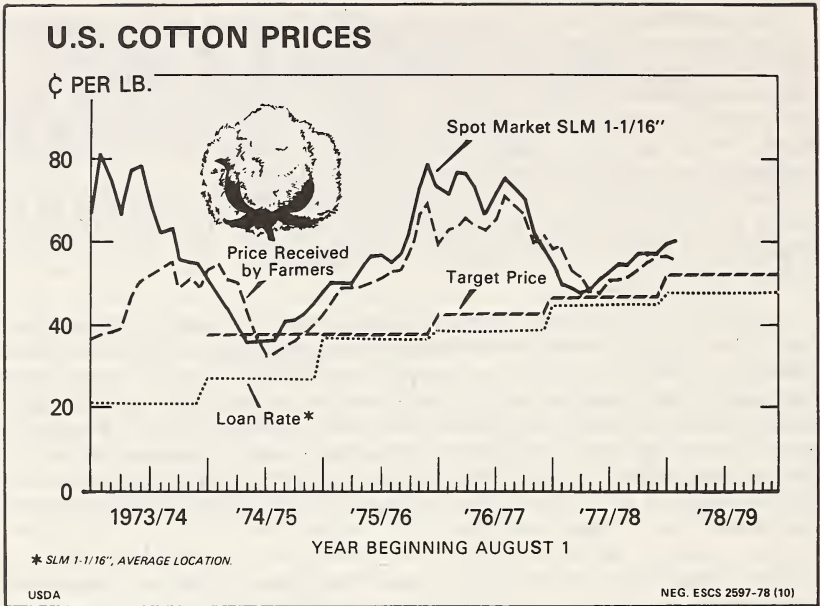


Figure 7

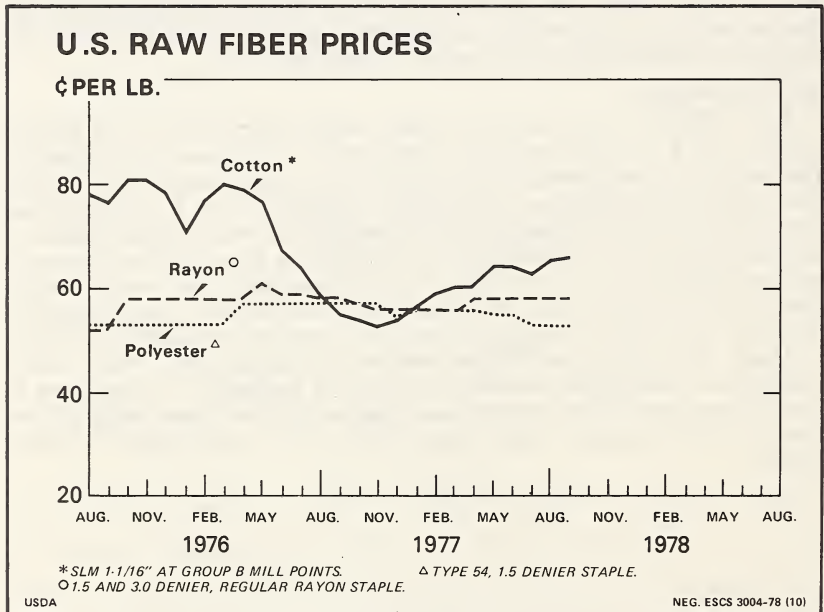


Figure 8

The economic outlook is full of uncertainties due to the unknown effects of such factors as income tax cuts in 1979 coupled with higher social security taxes, the wage-price guidelines, possibly higher oil prices, and higher interest rates which will hurt fiber use in household furnishings and other consumer durables. In sum, it appears that the textile industry will do well just to maintain its present level of activity.

FOREIGN OUTLOOK FOR 1978-79

As a preliminary to the U.S. raw cotton export outlook, let's now examine prospective foreign cotton production and use. The gap between foreign production and use is a good measure of our export potential.

Foreign production unchanged

According to reports of the Foreign Agriculture Service (FAS) of the USDA, foreign cotton production in 1979-80 could total 49.2 million bales, about the same as last season. The Soviet crop may be 300,000 bales below last season's output of 12.7 million bales as excellent growing conditions during the season apparently failed to overcome a late start caused by replanting a third of the crop. Damage to the crop from cold weather and frost during October, while limited chiefly to late-planted fields, appears to have held production below the record 1977-78 level.

The People's Republic of China is expected to harvest a crop of 9.6 million bales, up from 9.2 million in 1977-78. Government action to encourage an increase in cotton area apparently came too late to have much effect this season. And, yields are again being affected by drought.

World cotton production is expected to be about 60 million bales (± 1.5), down from 63.5 million last season. The decline in U.S. output is, of course, primarily responsible for the decline.

Foreign cotton consumption on rise

Foreign cotton consumption is expected to rise to 55.6 million bales (± 1.0) in 1978-79 according to the FAS. If realized, this would be an increase of 1.3 million bales from last season. And, given expected use of 6.3 million bales in the United States, world consumption could total about 61.9 million, the highest level since 1973-74.

Most of the expected increase in mill consumption is occurring in the Asian countries, especially Japan, South Korea, and Taiwan. These three nations took about 2.8 million bales of U.S. cotton during 1977-78. Consumption in the People's Republic of China is projected to increase marginally which may require her to increase imports of raw cotton in light of the recent crop shortfalls. Last season, the People's Republic of China took about 435,000 bales of U.S. cotton.

Foreign cotton stocks declining; prices rising

World cotton stocks were estimated to be 24 million bales this August 1, up from 21.1 million a year earlier. Increases in U.S. stocks accounted for all but one-half million bales of the increase as foreign stocks increased from 18.2 to 18.7 million bales. Given the production and consumption estimates noted earlier, world stocks may be worked down to around 21.6 million bales by August 1, 1979. Foreign stocks could be reduced by 1.6 million bales to 17.1 million next August, the lowest level since 1971 (fig. 9).

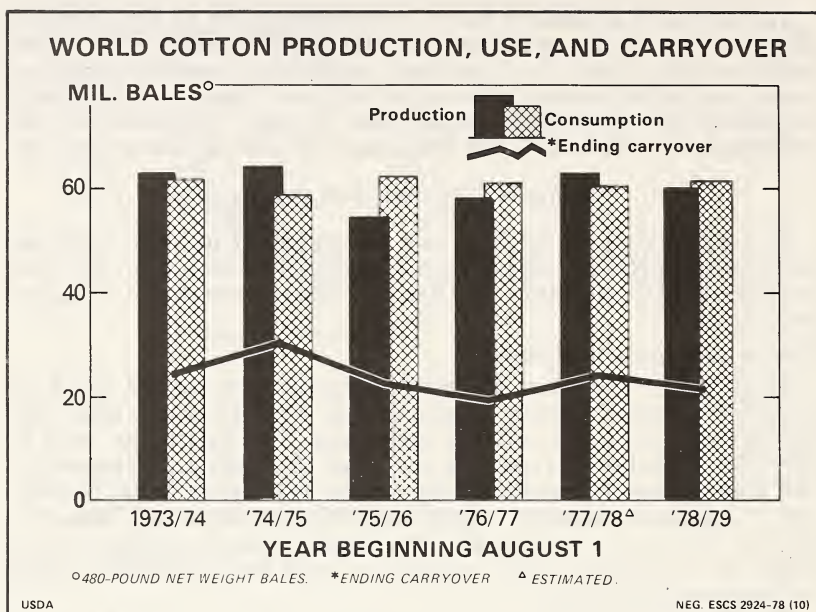


Figure 9

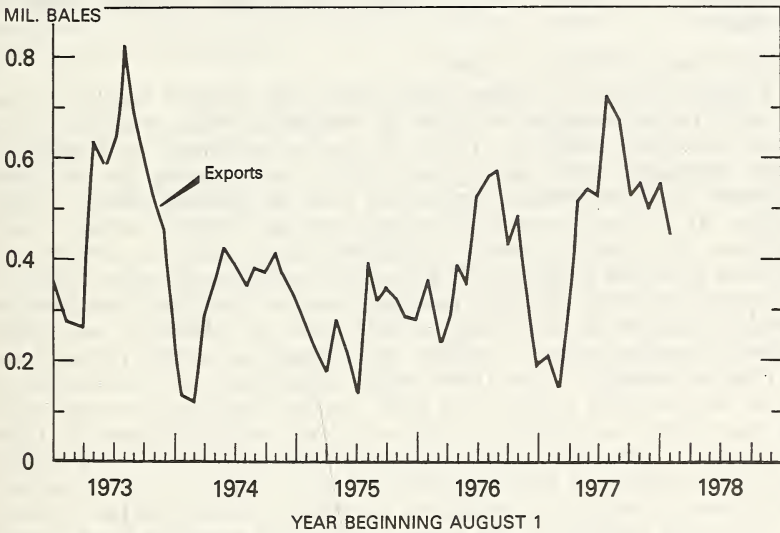
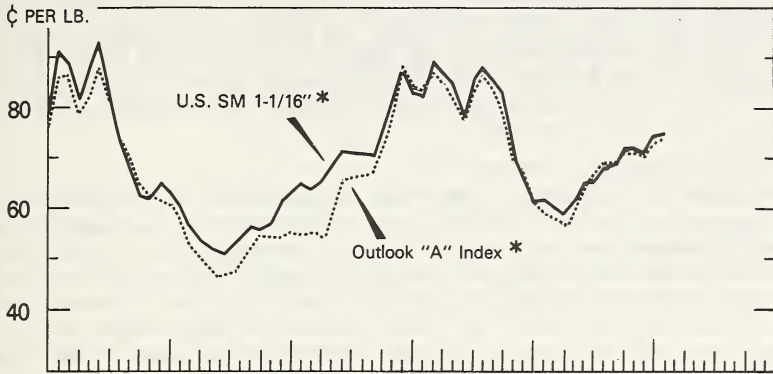
The tightening world cotton supply-demand situation is reflected by rising cotton prices. The Northern Europe outlook "A" index had risen to nearly 78 cents a pound in late October from a low of 58 cents a pound last November.

U.S. Cotton exports to continue strong

The projected foreign supply and demand balance sheet suggests another good year for U.S. cotton exports. By mid-October, exports for the 1978-79 season totaled about 1.1 million (480-pound) bales with outstanding sales for 1978-79 delivery of nearly 3.1 million. During the same period last season, exports totaled only one-half million bales but outstanding sales amounted to nearly 4 million.

Exports for this season are projected at 5.6 million bales (± 0.8), compared to last season's 5.5 million. Large foreign production deficits relative to consumption and competitive U.S. cotton prices are responsible for this prospective high export level (fig. 10).

U.S. COTTON EXPORTS AND PRICES



* C.I.F. NORTHERN EUROPE.

USDA

NEG. ESCS 2263-78 (10)

Figure 10

The 1978-79 cotton season to date has been one of tightening supplies and strong prices. Figure 1 indicates that, in recent years anyway, the U.S. cotton industry has shown a tendency for tight supplies and strong prices in one season to be followed by abundant supplies relative to demand and weaker prices in the following season. Let's shift our thinking to next season now and speculate as to whether this pattern could continue.

1979 Upland cotton program

Charles Cunningham from the Agricultural Stabilization and Conservation Service (ASCS) is here today to discuss the details of the 1979 upland cotton program. I'll mention in passing that the loan rate for SLM 1 $\frac{1}{8}$ -inch cotton at average location will be 50.23 cents a pound, up from 48 cents last year. The target price for 1979 will likely be 57-58 cents a pound, up from 52 cents in 1978. Upland cotton producers will continue to operate under the provisions of the Food and Agriculture Act of 1977 which, among other things, can require a set-aside of cropland and/or offer a voluntary acreage diversion program.

Acreage and production prospects

Acreage planted to cotton next spring will depend mainly on the price of cotton relative to those of competing crops, especially soybeans and grain sorghum. Prices for cotton, soybeans, and sorghum have increased since last spring with cotton having the sharpest increase. And cottonseed prices are now 50 percent above a year earlier. If current price relationships prevail, cotton acreage could increase next year to nearly 14 million acres (with no acreage set-aside or diversion program). If some price weakness for cotton relative to competing crops develops between now and planting time, acreage would of course be less. But, at this time, it is hard to see cotton acreage dropping below 13 million on the basis of market prices alone.

Planted acreage in the Delta could range from 3 to 3.4 million in 1979, compared to 3 million in 1978. In the Southeast, acreage could increase from last year's 671,000 to 700,000 to 800,000 acres in 1979. Acreage in Texas and Oklahoma could range from 7.1 to 7.5 million acres, compared to 7.2 million last year. And, in the Far West, acreage could range from 2.2 to 2.3 million, up from 2.1 million the last 2 years.

The other variable in the cotton production equation is, of course, the average yield. Using a range of 430 to 510 pounds per harvested acre—average yields in 7 of the last 10 years were within this range—and the planted acreage extremes of 13 to 14 million implies a 1979 production range of about 11 to 14 million bales.

Cotton producers will likely be faced with higher production costs next spring. However, fertilizer prices this October were down slightly from last winter. And, agricultural chemicals' prices were 4 percent below a year earlier. Major cost increases will likely be for farm labor, fuels, utilities, seed, machinery, and real property taxes. Interest rates will also be higher.

Disappearance prospects

U.S. mill use will continue to depend heavily on general economic growth. Most experts see only a modest expansion next year and others are even less optimistic. Domestic mill use is likely to continue to be pressed by textile imports. And, don't forget about the dust standards. On the plus side, we may see increased denim and other heavyweight woven fabric production in the United States. So, on balance, it is my guess that mill use will likely remain at the current low level, perhaps in the 5.8- to 6.6-million-bale range.

The expected low level of foreign cotton stocks next August, coupled with expected larger U.S. output, suggests that 1979-80 could be another good year for U.S. exports. However, the major limiting factor is likely to be the degree of expansion in foreign cotton acreage next year in response to higher cotton prices, and average yields, which are, of course, highly related to weather conditions. Moreover, these higher prices could adversely affect cotton mill use. On balance, there seems to be a somewhat greater probability that our 1979-80 exports will be below this season's expected level.

In summary, market conditions today indicate a good possibility of 1979 production exceeding disappearance. As a result we could see a rebuilding of cotton stocks during the 1979-80 season—the reverse of developments this season.

IMPLICATIONS OF COTTON DUST STANDARD

(By Arlie L. Bowling, Director of Economic and Market Research, National Cotton Council of America)

On June 19 the Occupational Safety and Health Administration (OSHA) issued a cotton dust standard which has serious implications for all segments of the cotton industry and the many people involved in that industry. Additionally, it would have a serious impact on our national economy and on goods available to the people in our society as well as the prices they must pay for those goods.

Cotton dust and byssinosis have been a serious concern of our cotton industry since 1970. The industry has provided a high level of research and activity to protect the worker's health and to serve his best interests. Much progress has been made. Labor Department statistics show that the textile industry is one of the eight safest industries. The U.S. cotton and textile industry has a serious interest in the health and well-being of their people and will continue this concern with or without regulations.

The cotton dust standards apply to cotton gins, warehouses, cottonseed oil mills, cotton merchants, cotton textile mills, waste processors, and related industries such as railroads and motor carriers. The standards require employers to assure that workers are not exposed to dust levels exceeding specified limits.

In yarn manufacturing, OSHA's limit is 0.2 mg of dust per cubic meter of air. That's equivalent to two grains of common table salt per cubic meter. For weaving, the limit is 0.75 mg. The rule for cottonseed oil mills and other nontextile sectors is 0.5 mg.

OSHA has, in effect, issued a dust standard rather than a cotton dust standard because the instrument for measuring dust (vertical elutriator) is incapable of distinguishing between cotton dust and other dusts. Similarly, OSHA has issued a respiratory disease standard rather than a byssinosis standard. Cotton will be blamed for all respiratory diseases (e.g., bronchitis, emphysema, et cetera) found in workers regardless of the true cause. Workmen's compensation claims and expenses among cotton industry employers will increase unjustifiably.

Under certain circumstances, employers are obligated to provide and require employees to wear respirators. The standard also requires highly sophisticated and expensive employee exposure monitoring and medical examinations—services often overburdened or not available in many of our rural communities. The records on what in many cases is a highly mobile work force must be maintained for 20 years.

All sectors of the industry are covered, despite the fact that NIOSH, sister agency of OSHA, currently has studies underway in a number of sectors to determine if a significant health problem exists in them and, if so, what technology exists to reduce dust levels.

For the last 2 years, the cotton industry has been cooperating with NIOSH in establishing prevalence studies in gins, warehouses, oil mills, cotton classing offices, and the waste cotton industry. Additionally, NIOSH has studies underway with industry cooperation to determine the availability of dust control technology for spinning, winding, warping, weaving and knitting areas in textile mills and in gins, oil mills, and waste cotton plants.

Also, the hearing record clearly shows there are no medical studies that give a basis for establishing a dust level in these sectors. In fact, OSHA states in the preamble to the standard that it was forced to draw conclusions from data which do not totally lend themselves to specifying a safe exposure for each operation.

Gins are covered under a separate standard. Since no exposure limit is specified for gins, there should be no capital cost for engineering controls. There will be some costs, as well as some frustrations, related to medical monitoring and other administrative procedures.

Much of the controversy and confusion surrounding the cotton dust standards have centered on their cost and potential impact. I will review some of the activities that were very much in the news during the few weeks immediately preceding issuance of the dust standards.

You will recall that the President's Council on Wage and Price Stability and the Council of Economic Advisors were expressing grave concern about the standards' cost and inflationary impact. At that time OSHA was using a figure of \$625 million for the standards' capital cost.

Even that figure, which is far below the standards' real cost, was alarming to the administration's inflation watchers, and rightfully so. On May 23, the President's Council of Economic Advisors asked OSHA to postpone all congressional and industry briefings on the standards pending an inflationary impact assessment by the White House regulatory analysis review group.

That request brought forth a May 24 memorandum from Secretary Marshall to President Carter in which a number of inaccurate numbers were used to depict the number of people at risk from exposure to cotton dust and the cost of the standards.

This memorandum presented estimates claiming that from 600,000 to 800,000 employees are at risk from cotton dust. This is simply not the case. In fact, there are only some 535,000 jobs in the United States requiring the handling of cotton. Of these, over 160,000 are farmers who are not covered by the standard.

Based on a study conducted by the industry involving medical examination of 37,000 cotton textile workers, and other medical evidence, less than 1 percent were found to have both subjective and objective symptoms of reactions to cotton dust.

If you take that 1-percent frequency rate and apply it to the approximately 300,000 persons exposed to cotton dust, then you come up with a figure of only 3,000 employees who have any respiratory problem that could possibly be attributable to cotton dust. Clearly we are not faced with a problem of the magnitude OSHA would have the uninformed public to believe.

Testifying before a Senate oversight committee on OSHA, West Point Pepperell's president, Joe Lanier, Jr., said certain myths have developed concerning byssinosis' characteristics and prevalence. The first, he said, is the "brown lung" myth.

"No pathological examination has ever shown a discoloration of lungs due to cotton dust exposure. There is no such thing as a 'brown lung' disease. The term is a misnomer invented purely for its emotional impact. Indeed, there is no pathological evidence at all to distinguish byssinosis from other chronic obstructive lung diseases.

"Furthermore, it is impossible to determine from an X-ray if a person has byssinosis. Extensive medical research has been conducted or sponsored by industry associations and individual textile companies, as well as various medical universities. But there is still a great deal of disagreement among the experts as to what constitutes a valid diagnosis of byssinosis. Such a diagnosis is made primarily through subjective medical questionnaire and by objective pulmonary function tests.

"I hasten to add that of the total number of employees showing some degree of reaction to the dust, only a few could be considered to be chronically affected. Which is not to say that the industry is indifferent about the health of even one single employee. As previously explained, the industry firmly believes that adequate steps have been taken or are in the process of being taken to protect our workers."

Let's now examine the costs that would be imposed by this standard. I will begin by quoting from Secretary Marshall's May 24 memorandum to the President:

"The economic considerations which are legitimately the concern of CEA/CWPS have been taken into account in this standard to the maximum extent possible. As mentioned above, the standard is approximately one-quarter as costly as the proposal made by the Ford administration. Our administration can claim credit for this cost reduction which, I think, will surprise even the cotton industry. Much of the recent clamor represents industry fears that OSHA will issue a final standard close to its initial proposal involving costs of \$2.7 billion."

That was precisely our concern and the record now shows that our concerns were entirely justified.

In the preamble to its standards, OSHA makes a lengthy review of the cost estimates placed in the record by industry sources and by its own contractor, Research Triangle Institute. For the cost of reducing dust levels in yarn manufacturing areas, OSHA cites estimates from industry witnesses that relate to the cost of reducing dust levels to 0.5 mg/m³ from roving through spinning operations rather than the 0.2 mg/m³ permissible level specified by the standards.

The end result is simply this—OSHA cited costs for regulations that were not nearly as severe as the regulations it issued. And these are the grossly understated costs cited by the Labor Department during the time OSHA was attempting to win White House approval to issue the standard. We are confident that these understated cost estimates were a major factor in winning White House approval for issuance of the standards.

The cost difference between 0.5 and 0.2 mg/m³ in the spinning through warping operations is approximately \$660 million. Making that adjustment alone would double OSHA's estimate of the standards' industrywide cost.

That will give you an idea of the magnitude of OSHA's error. Taking that tremendous cost understatement into account, and then adjusting for inflation, the standards' real capital cost is \$1.8 to \$2.6 billion, not \$657 million as OSHA claims. Annualized costs are \$550 to \$800 million. These compliance costs would add 17 cents to 24 cents per pound to the cost of producing cotton yarns and fabrics and, even then, all work areas would not be in compliance because compliance technology for some work areas does not exist.

The final standards' cost is near the cost of the initial proposal and, indeed, our concerns about the regulations' economic impact have been justified. The American cotton industry is paying the price for OSHA's reckless, irresponsible handling of the record which was compiled during the lengthy hearings.

For the cotton textile industry, \$2 billion represents the approximate equivalent of more than 7 years of profit. If these capital costs plus the increased operating costs were not passed on to the consumer, this means that for 7 years there would be no returns on investment for stockholders; no wage increases or employee profit sharing; and no investment for capital improvements, research and development and the creation of new products and new jobs; 7 years when the industry would literally dry up and even greater chunks of its markets would be lost to overseas manufacturers who are not faced with a rigid standard.

Even the Nation's largest textile companies find the standards to be technologically and economically infeasible. For example, a spokesman for Burlington Industries was recently quoted by Commodity News Service as saying, "In every case where it is humanly possible, the directive to industry is to switch to 100 percent synthetics."

Another large mill, M. Lowenstein & Sons, has switched one of its plants from polyester/cotton to polyester/rayon saying, "This is just the beginning. Whenever possible, we will try to use polyester instead of cotton. The OSHA dust standard is so onerous, we will not put up with the redtape."

The economic consequences of the standard on cottonseed oil mills is tragic.

A study conducted for the industry just prior to OSHA's hearing last year showed that the best available dust control technology would cost \$75 million. Since there are 83 cottonseed oil mills in the industry, the average capital cost would approximate \$900,000 per plant. Since these figures are based on 1974 costs, adjustment for inflation would put them at a higher level today.

The study also indicated that OSHA's standard would force 62 of the 83 active cottonseed oil mills to close their doors.

While OSHA rejected the study's finding that these expenditures would in effect close the doors of most cottonseed oil mills, the Agency did state it is unlikely that mills will be able to pass these excessive dust control costs forward. "Unlikely" is a gross understatement. Soybean, palm, and other edible oils—especially soy—dominate the market and establish the basic price level. Likewise, cottonseed meal must compete with soybean, fish, and other high protein meals, which hold nearly 90 percent of the market.

The solution, in OSHA's view, is to pass the cost burden backward to the cotton farmer. Since seed is regarded as a byproduct of fiber, OSHA reasons that the farmers would be forced to accept whatever is offered for the seed. I don't need to explain to this audience the folly of such shortsighted reasoning.

Obviously, the number of employees subjected to cotton dust is much less than the information on which the standard was based. The cost burden is excessive and destructive to the industry. The economic burden of the standard would impact not only on the cotton industry people but on the consumers.

The District of Columbia court granted an indefinite stay of the standard on October 19. It is critically important, not only to the health of the cotton industry and its workers but also to the health of the U.S. economy, that the best health interests of the workers be properly cared for in a more practical and realistic manner. The court is expected to hear oral argument on the matter in February and we remain hopeful that out of all this will come a more reasonable approach to insuring worker health and safety.

COTTON FARM PROGRAM

(By Charles V. Cunningham, Agricultural Stabilization and Conservation Service, USDA)

The present cotton farm program is authorized by the Food and Agriculture Act of 1977, as amended by the Emergency Agriculture Act of 1978. This legislation is applicable to the 1978 through 1981 crops. In addition to cotton, the act also includes programs for feed grains, wheat, soybeans, rice, sugar, peanuts, dairy, wool, and mohair.

The cotton program is designed to keep U.S. cotton competitive in world cotton markets and to provide some price stability so that our cotton can more effectively compete with synthetic fibers in both domestic and foreign markets. In addition, the program provides U.S. cotton producers income protection, market price protection and protection against crop losses resulting from disasters. It also provides a means for reducing acreage whenever cotton supplies are excessive.

The program keeps U.S. cotton competitive in world markets by providing a loan level based on the smaller of domestic or world market prices. The loan level also provides market price protection by placing a floor under cotton prices. The loan rate for Strict Low Middling (SLM) 1 $\frac{1}{8}$ -inch cotton—micronaire 3.5 through 4.9—net weight, at average location in the United States must be set at the lower of (1) 85 percent of the average U.S. spot market price for such quality of cotton during 3 years of the 5-year period ending July 31 of the year in which the loan level is announced, excluding the year with the highest and the year with the lowest average price in such period, or (2) 90 percent of the average price during the 15-week period beginning July 1 of the year in which the loan level is announced of the five lowest priced growths of the growths quoted for Strict Middling (SM) 1 $\frac{1}{8}$ -inch cotton C.I.F. Northern Europe (cotton outlook "A" index), adjusted by the difference during the 6-month period April 15–October 15 between such Northern Europe quotations and the U.S. spot market average for SLM 1 $\frac{1}{8}$ -inch cotton—micronaire 3.5–4.9. The loan rate cannot, however, be set at less than 48 cents per pound. In addition, whenever the Northern Europe calculation is less than the spot market calculation, the Secretary of Agriculture has discretionary authority to increase the loan level up to the spot market calculation. The 1978 loan rate is 48 cents per pound, the statutory minimum. The 1979 rate is 50.23 cents per pound, based on the spot market calculation.

Producers cooperating in the program are eligible for loans on their entire production. Such loans are for a term of 10 months from the first day of the month in which the loan is made plus an 8-month extension, at the producer's option, whenever the average spot market price for SLM 1 $\frac{1}{8}$ inch cotton—micronaire 3.5–4.9—during the 9th month of the loan period is 130 percent or less of such average price during the previous 36 months.

Whenever the average spot market price for a month exceeds 130 percent of the previous 36 months, a special global import quota, equal to 21 days of domestic mill consumption, must be opened up for a 90-day period. If a second special quota is triggered during a 12-month period, the second quota would be the smaller of 21 days mill consumption or an amount needed to increase the supply of cotton to 130 percent of the demand. Under normal conditions, imports of raw upland cotton are limited, by country, to small amounts.

The two provisions—the 8-month loan extension and the special import quota—are designed to help stabilize U.S. cotton prices. These provisions became effective on date of enactment of the 1977 act—September 29, 1977. Since that time, spot market prices each month have been below 130 percent of the previous 36 months. Therefore, loans maturing each month have been subject to extension at the producer's option.

Cotton farm income is protected through deficiency payments whenever the average price received by farmers for cotton during the calendar year in which the crop was planted is below the target price. Eligible producers receive payments at a rate equal to the difference between the target price and the higher of such calendar year average price or the loan rate. The 1978 target price is 52 cents per pound. It appears that the 1978 calendar year average price will be higher than this. If so, no deficiency payments will be made on the 1978 crop.

For the 1979 through 1981 crops, the target price will be the previous year's target price, adjusted to reflect changes in production costs, including variable costs, machinery ownership costs and general farm overhead costs during a moving 2-year period. For example, for 1979, average production costs for the 1977 and 1978 crops will be compared to such average costs for the 1976 and 1977 crops. The 1979–81 target price cannot be set at less than 51 cents. Based on current estimates of 1978 production costs, the 1979 target price will be around 58 cents per pound.

Deficiency payments, when required, are made on the farm planted acreage, except if the total U.S. planted acreage is larger than that determined necessary to produce estimated domestic and export needs, payment is made on each producer's share of the needed acreage.

A national program acreage—NPA—and voluntary reduction percentage are determined each year. The national program acreage is the acreage determined needed to produce estimated domestic and export needs, minus imports and adjusted to provide desirable stock levels. It cannot be less than 10 million acres. For 1978, the NPA was 10,248,000 acres. For 1979, it looks like it will again be around 10.2 million acres. Producers reducing planted acreage from the preceding year by the reduction percentage are guaranteed any deficiency payments on their total planted acreage. The reduction percentage in 1978 was 20 percent. For 1979, it will likely be 20 percent. The NPA and reduction percentage for 1979 must be announced by December 15.

Deficiency payments are limited to a combined total of \$40,000 per person under the upland cotton, wheat and feed grain programs in 1978. The limit will be increased to \$45,000 in 1979 and to \$50,000 in 1980 and 1981. Rice program payments will also be included in the combined total for 1980 and 1981.

Disaster payments are made to producers who are prevented by natural disaster or other conditions beyond their control from planting cotton or other nonconserving crops or who, because of such disaster or condition are prevented from harvesting at least 75 percent of normal production. Prevented planting payments are made on the smaller of the intended acreage or the previous year's plantings, including any prevented plantings. Low yield payments are made on the deficiency in production below 75 percent of normal. The disaster payment rate is one-third of the target price. The disaster provisions apply only to the 1978 and 1979 crops. A new comprehensive crop insurance program has been proposed to the Congress to replace the disaster program in 1980 and beyond but it has not yet been enacted.

The program provides authority for a set-aside of cropland from production whenever the supply of cotton is excessive. When a set-aside is in effect, producers must set-aside and devote to approved conservation uses an acreage of eligible cropland equal to a specified percentage—not to exceed 28 percent—of their planted acreage that year in order to be eligible for loans and payments under any USDA commodity program. In addition, producers must limit the total acreage of certain specified crops to the normal acreage of these crops on the farm minus the set-aside acreage. When a set-aside is in effect, the acreage of cotton on a farm may also be limited. Also, when a set-aside is in effect, the target price may be adjusted upward to compensate producers for participating in the set-aside. There is no set-aside requirement under the 1978 program. No determination has been made on set-aside for 1979.

In addition to the set-aside, a paid voluntary diversion program can be offered if it is determined necessary to adjust cotton acreage to desirable goals. There was a 10-percent voluntary diversion program in effect for 1978. Participating producers diverted an acreage of eligible cropland to conserving uses equal to 10 percent of their 1978 planted acreage. In addition, they had to reduce 1978 cotton planted acreage from 1977 by the amount of diversion. Approximately 400,000 acres were diverted from cotton production under this program. The payment rate was 2 cents per pound on the planted acreage. As with set-aside, no decision has been made on a diversion program for 1979. The announcement on set-aside and diversion for 1979 will likely be made at the same time the national program acreage is announced.

U.S. OILSEEDS AND PRODUCTS OUTLOOK

(By George W. Kromer, Agricultural Economist, Economics, Statistics, and Cooperatives Service, U.S. Department of Agriculture)

The 1978-79 oilseed outlook is for near-record high supplies, continuing strong demand both here and abroad, small changes from this year's relatively low carryover stock levels, and prices averaging higher than during the last marketing year.

The United States harvested a record 81 million acres of oilseeds this fall, about 5 million more than in 1977. Increased soybean acreage—up 6 million acres—more than offset declines in cottonseed acreage—off 1 million acres—and an increase of one-half million acres in sunflowerseed was about offset by a similar drop in flaxseed acreage. Peanut acreage remained unchanged from last year's level.

HARVEST PRICES STRONG

The demand for oilseeds and products is unusually strong this fall and has boosted prices to farmers well above the levels of a year ago.

The U.S. average farm price for soybeans in October was \$6.41 per bushel, about \$1.13 above October 1977. Strengthening soybean prices reflect the heavy crush and export rates to date while farmers store large quantities of beans.

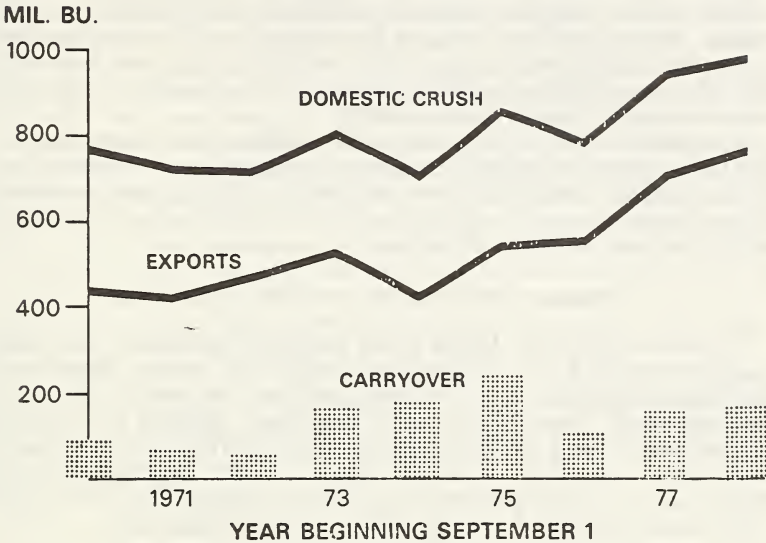
Soybean prices probably will continue strong through at least winter; thereafter they will be influenced by developments in the South American soybean crops to be harvested next May. A record harvest there may cause soybean prices to weaken when new-crop South American soybeans become available. However, if the projected increases in Brazil and Argentina soybean crops don't pan out, then U.S. soybean prices will continue strong all season.

U.S. SOYBEAN SUPPLY UP 5 PERCENT

Soybean farmers harvested a record 63 million acres this fall, nearly a 10th more than in 1977. But wet a spring and late plantings resulted in yields of an estimated 28.3 bushels per acre, down 2.3 bushels from last year's record high. Consequently, this year's soybean crop, while still record high, is only 2 percent above 1977. As of October 1, the 1978 soybean crop was estimated at 1,792 million bushels, compared with 1,762 million in 1977. And with carryover stocks last September at 159 million bushels—up 56 million from September 1977—the total 1978-79 soybean supply is boosted to 1.95 billion bushels, compared with 1.86 billion in 1977-78.

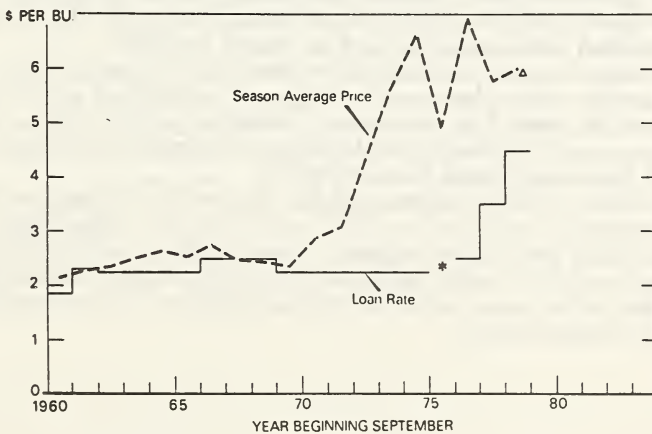
Soybean supply and demand in 1978-79 appear to be in fairly close balance—with both domestic crush and exports increasing to new highs—leaving carryover stocks on September 1, 1979, at around 170 million bushels, or near the 159 million bushels this year.

U.S. SOYBEAN USE*



* EXCLUDES PLANTING SEED AND SOYBEANS USED AS FEED.

SOYBEAN LOAN LEVELS AND FARM PRICES



* No loan rate for 1975/76

Δ Estimated

CRUSHINGS TO SET NEW RECORD

Soybean crushings this season are estimated at around a record 970 million bushels, compared with 927 million in 1977/78. This rise mainly reflects the prospective increase in soybean meal feeding because of favorable feeding price ratios. More poultry, cattle, and hogs will be fed. The crush during September-October is estimated at 162 million bushels, about 35 million above 1977.

A season's crush of this size would utilize about three-fourths of the U.S. industry's 1978/79 processing capacity—now estimated at 1.3 billion bushels, up slightly from last season. The industry operated at three-fourths capacity in 1977/78, a little below the long-term average utilization rate of about 80 percent.

SOYBEAN EXPORTS HEADED FOR NEW HIGH

Soybean exports in 1978/79 are projected at around 730 million bushels compared with 700 million bushels last season. Brazilian and Argentine soybeans and products will not be available on world markets until May 1979. So, U.S. soybean exports will face little competition during the first half of the 1978/79 marketing year and could be as much as 75 million bushels ahead by February. From September 1 through October 27, soybeans inspected for export totaled 107 million bushels, about 33 million more than last year.

1979 ACREAGE MAY BE UP

Soybean acreage in 1979 probably will increase from the 64.4 million acres planted this year, if soybean prices remain favorable to feed grains. The soybean/corn price ratio in early November was 3 to 1 and the March 1979 ratio (based on Chicago futures prices) showed the same price relationship. A soybean/corn price ratio of $2\frac{1}{2}$ to 1 is considered favorable for soybeans.

On the other hand, the soybean/cotton price relationships are not favorable for soybean expansion so some land in the Delta area may be switched from soybeans back to cotton in 1979.

Soybean farmers are likely to be faced with higher production costs next spring when planting decisions are made. Cost increases are in prospect for seed, fuel and energy, machinery, farm labor, real property taxes, and interest. Only fertilizer and agricultural chemical costs might be slightly lower than in 1978.

The U.S. index of prices paid by farmers for all production goods and services in mid-October 1978 was 12 percent higher than in 1977.

The 1979 feed grain program will also be an additional element which farmers will need to factor into their cropping plans. This is in addition to the usual variables such as weather and price relationships with competing crops.

SOYBEAN OIL DOMESTIC USE GAINS

Soybean oil supplies in 1978/79 are projected at about 11½ billion pounds, compared with 11 billion last season.

Domestic use is expected to total around 8½ billion pounds, about 4 percent more than in 1977/78. U.S. supplies of competitive cottonseed oil, lard, and butter will be smaller than in 1977/78, but greater quantities of sunflowerseed oil, corn oil, peanut oil, and imported palm oil are expected to be available. The domestic consumption of soybean oil has shown a strong uptrend for many years and now accounts for over 60 percent of all food fats and oils utilized in the United States.

Soybean oil exports in 1978/79 are projected at about 1.8 billion pounds, down from last season's record high 2 billion pounds. Public Law 480 sales (titles I and II) are expected to total 0.4 billion pounds in 1978/79, CCC credit sales another 0.2 billion pounds, and the remainder dollar sales. The prospective decline in export demand mainly reflects improved oilseed crops in many foreign countries.

In 1977/78, about one-fourth (500 million pounds) of the year's exports went to India, where vegetable oil consumption is growing. The PRC and Pakistan imported large quantities—an estimated 450 million pounds. Peru, Iran, and Bangladesh were also large importers of U.S. soybean oil.

Soybean oil prices during 1978/79 are expected to be relatively more stable than last season—possibly averaging near last year's 25 cents per pound. Of course, any unexpected pickup in export demand from India or the PRC will provide more strength to U.S. soybean oil prices.

SOYBEAN MEAL USE EXPANDING

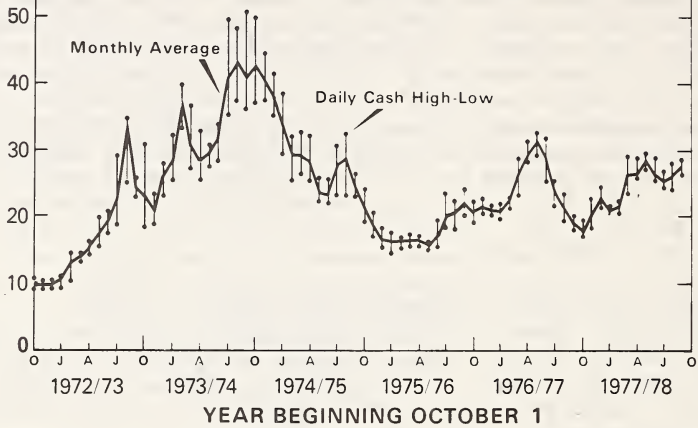
U.S. soybean meal supplies for 1978/79 are projected at 23.3 million short tons, compared with 22.6 million last season. Domestic use of soybean meal is projected at 17.2 million tons, some 5 percent more than in 1977/78. The increases in farrowings, broiler production, and cattle on feed all point to heavier consumption of high-protein feeds in 1978/79. Feed use of corn and other grains is expected to increase some 7 percent in 1978/79, which will also stimulate the demand for soybean meal, although corn prices likely will be more competitive.

Soybean meal exports are expected to be maintained at around 5.8 million short tons, slightly below 1977-78. A supporting factor has been the decline in the U.S. dollar value relative to European currencies and the Japanese yen. Over half of our meal exports are to the European Community (EC), with Japan and East Europe also ranking as large importers.

The bulk of U.S. soybean meal moving abroad is in the form of soybeans, rather than the processed commodity. Many countries

SOYBEAN OIL PRICES, CRUDE, DECATUR

¢ PER LB.

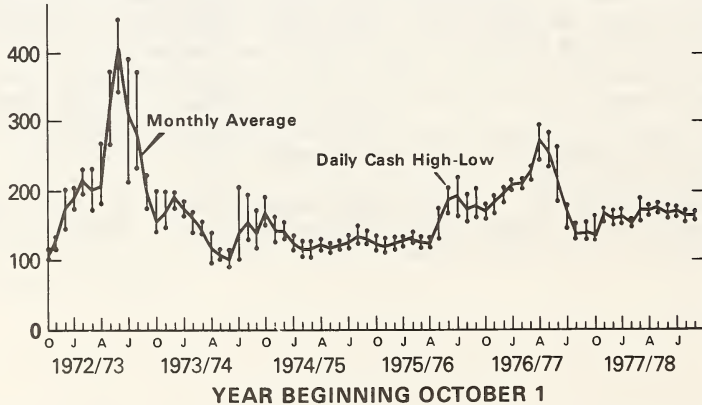


USDA

NEG. ESCS 2510-78 (10)

SOYBEAN MEAL PRICES, 44% PROTEIN, DECATUR

\$ PER TON



USDA

NEG. ESCS 2694-78 (10)

prefer to process soybeans, and Brazil has moved large quantities of soybean meal into the world markets in recent years.

Soybean meal prices (44 percent protein, Decatur) during 1977-78 fluctuated between \$135 per ton and \$177, averaging \$164. Prices during 1978-79 are expected to be relatively more stable, averaging around \$180 per ton.

PALM OIL IMPORTS MAY INCREASE SLIGHTLY

Palm oil imports into the United States during 1978/79 may increase from the 375 million pounds of last season, possibly approaching around 425 million. A rebound in Malaysian palm oil production—from the drought-stricken output of last year—could encourage expanded imports, assuming prices become competitive with domestic soybean oil.

Palm oil prices (cost including freight, U.S. ports, bulk) increased from around 20 cents per pound in October 1977 to 31 cents in July 1978, and then softened a little in August and September. For the entire 1977-78 marketing year, which ended in September, prices averaged about 26 cents per pound, approximately 2 cents above the previous year. Prices in early November were around 30 cents, about 10 cents above a year ago and somewhat above soybean oil.

COCONUT OIL IMPORTS MAY DECLINE

Coconut oil imports during the 1978-79 marketing year may drop from the 1-billion-pound level of last season, if coconut oil prices continue near their currently high levels. Philippine coconut oil output in 1979 is expected to be down about a tenth from this year, an indication that relatively high world prices probably will continue. United States use likely will drop from the 1-billion-pound level of last season if imports are near our estimate.

Coconut oil prices (crude, Pacific Coast) during 1977-78 averaged 30 cents per pound, approximately 2 cents above the previous year. Prices rose from 24 cents in October 1977 to 40 cents in September. Prices in early November were 43 cents, about 19 cents above 1977.

1978 COTTONSEED CROP OFF SHARPLY

Reduced harvested cotton acreage and smaller cottonseed yields per acre resulted in sharply lower cottonseed production in 1978. Output is estimated at 4.2 million short tons, about a fourth below last year's crop. Cottonseed supplies for the 1978-79 marketing year, which began August 1, are estimated at 5 million short tons, about 13 percent below last season. Larger carryover stocks on August 1 partially offset the sharp reduction in output.

Prices received by farmers for cottonseed in October averaged \$110 per short ton, up from \$74 a year earlier.

Cottonseed oil supplies for the 1978-79 marketing year are estimated at 1.4 billion pounds, somewhat below last year. Domestic disappearance may approximate the seven-tenths billion pounds of last season. However, large supplies of such competing oils as soybean and sunflower will provide more competition.

Cottonseed oil exports are expected to fall below the seven-tenths billion pounds of last year. Although world supplies of vegetable oils likely will be larger, U.S. cottonseed oil is preferred in Western Europe, South America, and Egypt, and should remain competitive in these areas.

Cottonseed oil prices (crude, Valley) are strong, reflecting in part the smaller cottonseed crop and good demand for cottonseed oil. During August–October, prices averaged 31 cents per pound, about 10 cents above the same period a year ago. Prices may moderate some as crushings and oil production increase seasonally. Nevertheless, prices likely will remain relatively strong. Last season, prices averaged 24 cents per pound.

1978 SUNFLOWERSEED CROP RECORD HIGH

U.S. sunflowerseed production is forecast at a record 3.4 billion pounds, up 23 percent from 1977. This estimate is for all sunflowers produced in North Dakota, South Dakota, Minnesota, and Texas. Of course, other States grow sunflowers commercially too, but national data are not available. Most sunflowers produced in the United States are of the oilseed variety, although the birdfeed variety is also important. Market prices for sunflowerseeds this year are averaging better than 11 cents per pound, up almost 3 cents from last year.

Exports are still the largest outlet for U.S. sunflowerseeds, with about two-thirds of the 1978 crop probably moving overseas—West Europe is the big market. Domestic demand for sunflowerseed oil is on the increase as more manufacturers are using it as an ingredient in margarine and salad oil.

LARD OUTPUT MAY DECLINE

Lard production in 1978–79 is estimated at just under 1 billion pounds, off slightly from the previous year. Although hog slaughter may be up a little, lower lard yields per hog will be more than offsetting as high pork prices likely will favor lighter fat trim and slightly lower lard outturns.

Domestic disappearance of lard is expected to total near the eight-tenths-billion-pound level of the past 3 seasons, the all-time low. Exports in 1978–79 again may approximate two-tenths billion pounds, the same as last season.

Lard prices (tanks, loose, Chicago) last season averaged around 22 cents per pound, roughly 1 cent below the previous year. Prices ranged from a low of 19 cents to a high of 26 cents. Prices this season are starting at a higher level and likely will continue so. Nevertheless, lard prices are still averaging below such other major food fats as soybean, cottonseed, and palm oils.

NEW PEANUT PROGRAM STARTED WITH 1978 CROP

The Food and Agriculture Act of 1977 amended the peanut price support program by establishing a two-tier pricing system and national poundage quotas which limit the quantity of peanuts eligible for support at the higher price. For the 1978 crop, the national acreage allotment is 1,614,000 acres, and the national poundage quota is 1,680,000 tons, both at the legal minimum.

The 1978 crop loan rate for quota peanuts is \$420 per ton (21 cents per pound), the legal minimum. The Secretary has discretionary authority to increase the quota loan rate and to establish the loan rate for additional peanuts, taking into consideration export and crushing demand and price levels.

The 1978 peanut crop is estimated as of October 1 at a record 4 billion pounds (farmers' stock basis), 6 percent above the 1977 output. Record production in the Southeastern area mainly accounts for the increase. Production is down slightly in the Southwest and about unchanged in the Virginia-North Carolina area. National average yield per acre at 2,608 pounds is up 151 pounds from last year and a new record. Adding carryover, the 1978-79 peanut supply totals 4.5 billion pounds, about 4 percent above last year.

Edible use of peanuts in 1978-79 is expected to increase around 3 percent from last season's level, possibly totaling 1.9 billion pounds or about 9 pounds per person. Last year, use in edible outlets totaled 1.85 billion pounds, or 8.6 pounds per person.

Last season, peanut crushings declined to below 500 million pounds (farmers' stock basis), about 56 percent below 1976-77 and the smallest crush since 1964. A smaller 1977 peanut crop, plus good overseas demand for U.S. peanuts, were instrumental in the reduced crush. With larger peanut supplies this year, and with prospective foreign demand not as strong, domestic crushings should increase to about 1 billion pounds, or double the 1977-78 rate.

Peanut exports, which soared to a record 1 billion pounds last season, may decline slightly this year. Increased peanut supplies in major producing areas of the world, such as India and Africa, are expected to lessen the dependence upon U.S. supplies. The United States is a residual supplier in foreign markets when world peanut supplies are short. U.S. exports last season were mainly edible peanuts where historically we shipped peanuts abroad primarily for crushing.

Despite prospects for increased domestic use, peanut supplies exceed requirements for edible and farm use. As a result, the Commodity Credit Corporation (CCC) is expected to take under loan about 15 percent of the crop.

The 1978 peanut crop is being supported at a national average loan rate of \$420 per ton (21 cents per pound), compared with \$430.50 in 1977. However, last season, farmers were required to pay \$20 per ton to cover storage, handling, and inspection costs. Because these fees will not be charged this year, farmers will receive the entire \$420, compared with the effective support level of \$410.50 in 1977.

Each peanut farm is assigned a peanut acreage allotment and a poundage quota. If more peanuts are grown on the acreage allotment than are covered by the farm's poundage quota, these extra peanuts are termed "additional" and are supported at a lower level than quota peanuts. For the 1978 crop, the support rate for additional peanuts is 59.5 percent of these for quota peanuts.

Prices received by farmers during the 1978-79 marketing year are averaging around 21 cents per pound, near the support level and near last season's average.

FLAXSEED SUPPLIES TIGHTEN

The 1978-79 flaxseed supply totals 18 million bushels, nearly 2 million bushels below last season. The 1978 flaxseed crop, at 11.7 million bushels, is about 4½ million bushels below 1977 and mainly accounts for the decline. The reduced output stems from a sharp drop in harvested acreage, which at 900,000 acres is down about a third. Yield per acre, at 12.6 bushels, is up over 1 bushel. Starting stocks on June 1, 1978, totaled 6 million bushels, double a year ago.

Flaxseed crushings likely will total around 11 million bushels, down from the 11.6 million of last season. The smaller supplies likely will limit crushings, although in recent years the crush has ranged between 10 and 12 million bushels. Crushings hit a record low of 10.7 million bushels in 1976/77, a year of record low supplies and high prices. Flaxseed crushings in the early 1950's were as high as 42 million bushels. Declining demand for linseed oil is the main factor behind the long-term downtrend in crushings.

Flaxseed prices received by farmers during June-October averaged \$5.15 per bushel, compared with \$4.69 for the similar period last season. Prices dropped from \$5.66 last June to \$4.75 in July. Subsequently they increased to over \$5. Some seasonal increases are likely over the next several months.

On July 20, USDA announced a national purchase price of \$4.50 per bushel for 1978 crop of flaxseed. This purchase agreement program is the first type of price support offered by USDA for flaxseed since 1974. Under the program, producers sign agreements that obligate the CCC to purchase flaxseed at the country purchase price. These agreements are not binding on producers. Producers may sell their flaxseed at any time, thus voiding the agreement.

U.S. TALLOW OUTPUT MAY DECLINE IN 1979

U.S. tallow and grease production has doubled during the past 2 decades, rising from 1½ million tons in 1958 to an estimated 3 million for 1978; the average annual rate of increase was about 4 percent. Production hit a peak of 3.1 million tons in 1977 and held near that level in 1978. It is expected to decline slightly in 1979. Cattle slaughter probably will decline more than tallow output in 1979, since a larger proportion of the slaughter will be from feedlots. Cattle from feedlots likely will be heavier and will yield more tallow than the grass-fed animals.

More than one-tenth of the total U.S. output is edible tallow and its proportion to inedible is expected to gain. The trend toward deboning of beef at the packer and distribution centers and shipping boxed beef results in higher output of edible tallow—which often commands a price premium of \$66 to \$88 per ton over the inedible grades.

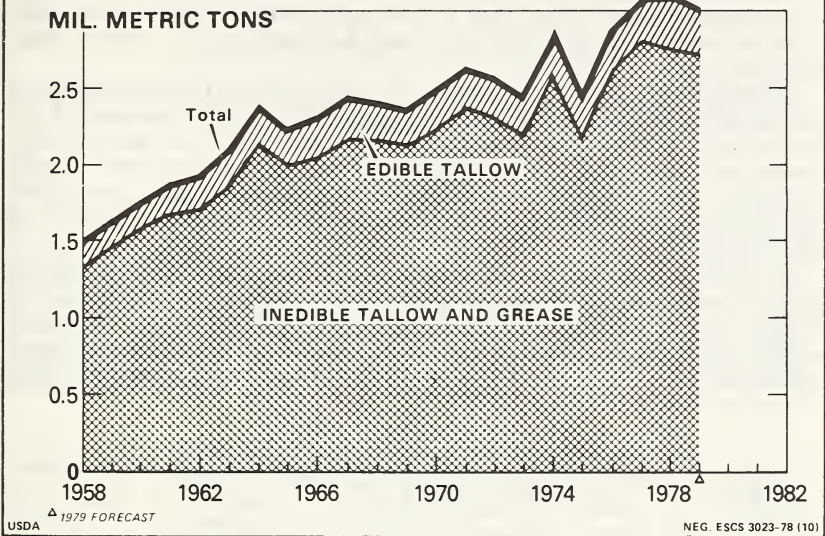
The trend toward shipping boxed beef is increasing. According to some trade estimates, about 30 percent of all beef carcasses are now fabricated and boxed at the packer level, and another 30 percent boxed at central distribution centers. One trade source estimates that by 1980 more than three-fourths of all beef will go to retail stores in boxes.

TALLOW OUTPUT AND CATTLE SLAUGHTER

Tallow and greases are primarily a byproduct of the commercial beef and hog industries. Tallow, produced from rendering beef fats, is the major component.

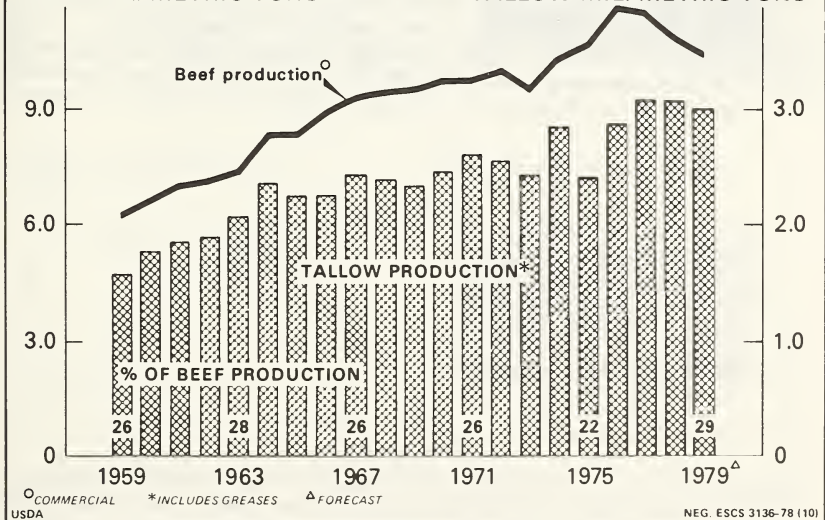
U.S. commercial cattle slaughter has expanded from about 23 million head in 1959 to a peak of nearly 43 million head in 1976, an increase of some 86 percent. Slaughter has since dropped and for 1979 is projected about 15 percent below the 1976 record. Tallow output,

U.S. TALLOW AND GREASE PRODUCTION TRENDS



U.S. BEEF AND TALLOW PRODUCTION TRENDS

BEEF MIL. METRIC TONS ——— TALLOW MIL. METRIC TONS

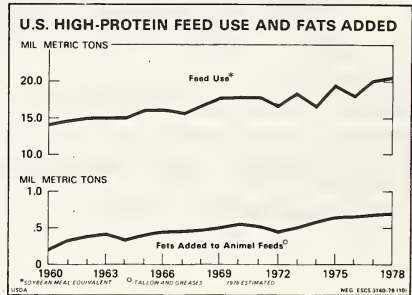
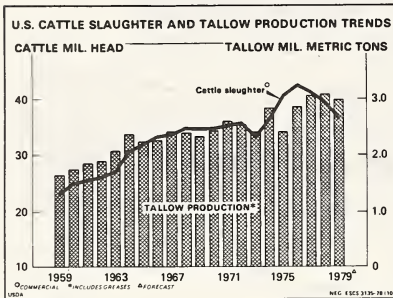


which is highly correlated with cattle slaughter, increased 84 percent during 1959-79, or in about the same proportion as cattle killed.

U.S. beef production and tallow output are also highly correlated. As a matter of fact, I find that in forecasting tallow production, more reliable results are achieved by using beef production rather than cattle slaughter.

There are several reasons for this. By using beef output we eliminate the necessity of estimating cattle weights and yields per animal. Also, the ratio of tallow production to beef output tends to be relatively steady and more predictable than the variables associated with cattle slaughter. Excluding 1975, annual tallow production as a percent of beef production (tallow/beef production ratio) ranged from 25 to 28 percent.

In 1979, I look for a tallow/beef production ratio slightly higher than in recent years because (1) a higher proportion of the cattle slaughter and beef will come from feedlots, (2) heavier slaughter weights, and (3) increased output of edible tallow. On the other hand, high beef prices may affect the amount of fat available for rendering if the fat trim is not so heavy.



1979 OUTLOOK FOR TOBACCO

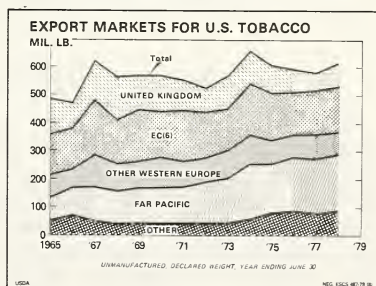
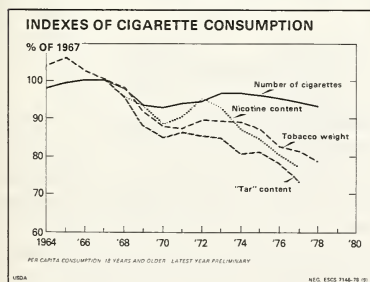
(By Robert H. Miller and Richard Hall, Agricultural Economists, Economics, Statistics, and Cooperatives Service, USDA)

The U.S. tobacco outlook for 1979 is highlighted by greater export demand and steady domestic prospects. The larger U.S. crop this year more than matches prospective use but reduced quota carryover for 1979 means next year's Flue-cured crop may have to be reduced. The current tobacco quota for Burley and acreage allotments for other kinds allow for production sufficient for current use. Lower total production next year and indicated higher support prices mean cash receipts may change little.

CIGARETTE TREND FLATTENS

Cigarettes remain the key to the amount tobacco used in the United States and our exports of unmanufactured tobacco and tobacco products. U.S. cigarette output should reach a record high level of 700 billion this year, in line with the trend in recent years of about 2-percent annual increase. Sales of low tar cigarettes (15 milligrams of tar or less) are rising to offset declines for other categories.

As the smoking age population continues to increase, U.S. smokers may smoke a few more total cigarettes even though consumption per person, 18 years and over, may decline slightly in 1978, to around 200 packs or 4,000 cigarettes. Measured in terms of nicotine content, "tar" content, and tobacco weight, per capita consumption has declined at a faster rate than indicated by number of cigarettes.



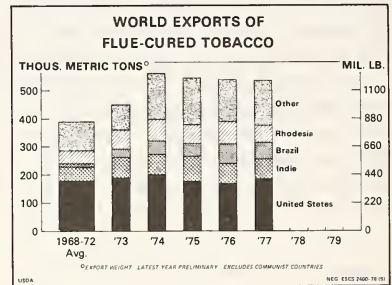
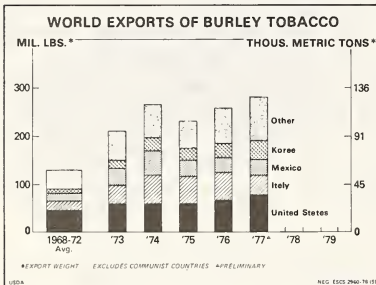
Antismoking publicity and legislation continue to increase. Some 33 States and many cities and counties have laws that either prohibit smoking in certain places or segregate smokers from nonsmokers. The U.S. Department of Health, Education, and Welfare has begun a program to discourage smoking. So far the effect of these actions on total tobacco use has been limited, but the cumulative impact over a number of years could be considerable.

Wholesale cigarette prices, wholesale-retail margins, and retail prices rose in 1978. A 6-percent rise in wholesale prices in June and rising retail margins meant a hike in cigarette prices of more than 4 percent for the year.

One State raised excise taxes in 1978. Direct excise taxes vary from 2 cents per pack in North Carolina to 21 cents per pack in Connecticut and Massachusetts and 23 cents in New York City. To combat evasion of State cigarette taxes, Congress last month passed a contraband cigarette bill, S. 1487. The bill defines contraband cigarettes as 60,000 cigarettes not bearing tax stamps of the State where located.

Cigar and smoking tobacco consumption is trending down. Use of large cigars in 1978 will total about 4.8 billion, 4 percent below 1977 and only half of the 1964 peak. Also, small cigar output may fall one-tenth below the 2.1 billion total of 1977. Smoking tobacco output in 1978 is down 8 percent to an estimated 37 million pounds, a record low. Next year consumption may drop further.

Snuff output remains about the same. By contrast, chewing tobacco output probably reached 92 million pounds this year, 6 percent more than 1977's level. This overall gain may be associated with increased outdoor leisure activity and employment gains in industries where smoking is either prohibited or inconvenient. Also, chewing tobacco and snuff advertisements have appeared on television and radio



EXPORTS ARE GAINING IN QUANTITY AND VALUE

The value of U.S. tobacco and tobacco products exports in 1978 may gain from last calendar year's record high to around \$1.8 billion. Both the value and quantity of unmanufactured tobacco and tobacco product exports are expected to exceed last year's high level, which was slowed by a dock strike. In recent years, leaf and product exports have taken about four-tenths of the U.S. tobacco crop. This year, U.S. tobacco exports will register about a \$1.4 billion surplus over tobacco imports for consumption of about \$400 million. This favorable tobacco trade balance, along with strong sales of other agricultural products, is helping offset the country's trade deficit in nonagricultural products.

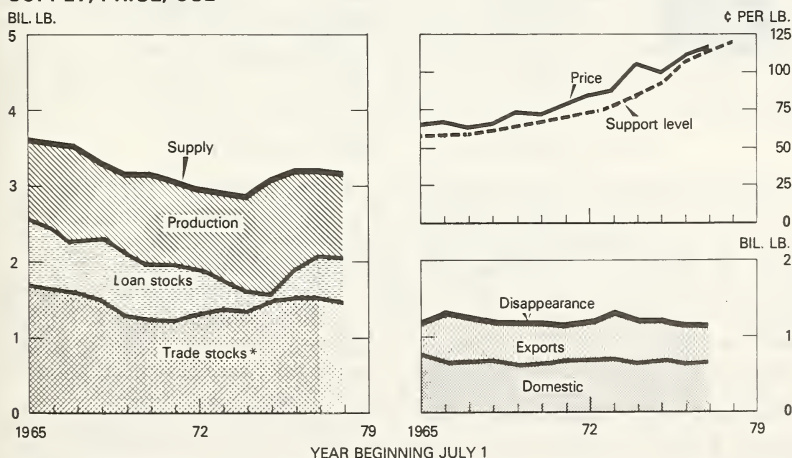
Unmanufactured tobacco exports in 1978 may surpass the high level of 629 million pounds (705 million farm sales weight) shipped last year. Despite our rising price level, 1978 exports are being strengthened by the high quality of the 1978 crop, a slowdown in production overseas and the jump in the value of overseas currencies. World cigarette production continues to rise around 2-3 percent annually and the preference for blended cigarettes containing Flue-cured and Burley tobaccos continues. In our major market, the European Community, takings of U.S. tobacco are ahead of 1977. More is going to the United Kingdom; Italy's takings remain stable. However, purchases by West Germany and Japan have been down.

World tobacco output this year may total below the 12 billion pounds (5.43 million metric tons) produced in 1977, chiefly because output in Africa and South America is temporarily stabilizing. The long-term trend is for Flue-cured and Burley production abroad to rise relative to the United States as foreign use of these less expensive tobaccos increases.

Imports accounted for about 25 percent of U.S. manufacturers' tobacco utilization last year (20 percent of use for cigarettes and 50 percent for cigars and chewing tobacco). Oriental cigarette leaf is the principal kind imported but other kinds of leaf and scrap are increasing. Cigarette tobacco imports for factory use this year may jump to around 210 million pounds. This includes 50 million pounds of scrap and about 40 million pounds of Flue-cured and Burley leaf.

Cigar tobacco imports are mainly filler tobacco and for this year will probably total about the same as the 83 million pounds of last year

FLUE-CURED TOBACCO: SUPPLY, PRICE, USE



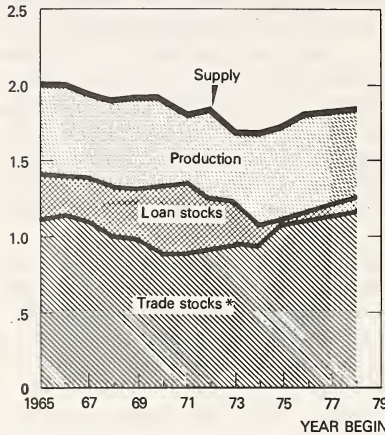
*MANUFACTURER'S AND DEALERS'. LATEST YEAR FORECAST.

USDA

NEG. ES53-223-C-78 (2)

BURLEY TOBACCO: SUPPLY, PRICE, USE

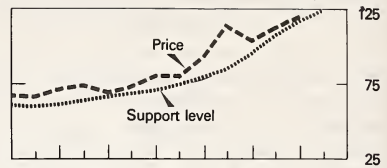
BIL. LB.



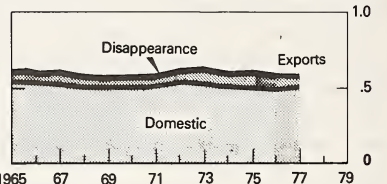
* MANUFACTURERS' AND DEALERS'. LATEST YEAR FORECAST.

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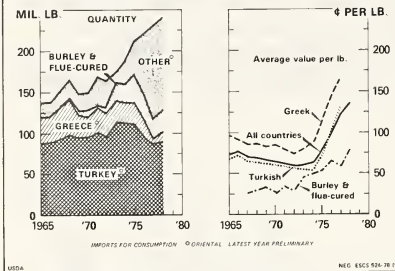
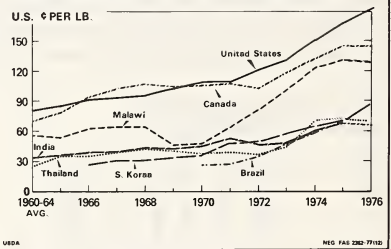
¢ PER LB.



BIL. LB.



NEG. ESCS-381-C-78 (2)

U.S. IMPORTS OF CIGARETTE TOBACCO**FLUE-CURED TOBACCO: AVERAGE ESTIMATED EXPORT PRICES, BY MAJOR PRODUCERS****LEAF PRODUCTION MAY REMAIN RESTRICTED**

The most notable developments for U.S. producers in 1978 were the USDA-sponsored "4-leaf" program for Flue-cured producers, a rebound in crop quality, and a spurt in producer prices. Despite a slowdown in utilization and relatively high loan holdings, prices at Flue-cured auctions jumped to new records. Cash receipts are expected to increase in 1978 because of the larger volume and higher prices. Higher costs particularly for labor, pushed tobacco production costs up about 7 percent per pound from 1977. Lease rates for the Flue-cured tobacco continue to rise as growers bid for limited poundage quotas.

Total tobacco production is up 11 percent this season. Adding the slightly larger carryover, total supplies for the 1978/79 marketing year are up about 2-3 percent from last year. With vigorous auction bidding and higher support levels, Flue-cured tobacco prices averaged 14 percent above 1977's record level. When Burley markets open next week,

prices may rise and set a new record, surpassing the 1977 season's record of \$1.20 per pound. The 1978 Burley support level exceeds the 1977 market price and the 1978 crop is about the same size.

At the beginning of the 1978-79 marketing year, all types of tobacco held under loan totaled 650 million pounds (farm sales weight) or about the same as a year-earlier level. The smaller volume of loan tobacco from this season's Flue-cured crop has been offset by relatively limited sales of previous crops under loan. A large share of the old crop loan stocks are the less desirable, low stalk tobacco. In 1979, grower participation in the voluntary "4 leaf plan" or some similar measure to limit marketings of tobacco in weakest demand could reduce excess stocks of lower stalk tobacco.

Government price support is mandatory for tobacco produced under marketing quotas. According to the legal formula that sets the tobacco price support levels, support will go up an estimated 7 percent next year over 1978. The increase results from a rise in the parity index—which is a measure of changes in prices paid by farmers, including wages paid to hired labor, interest, and taxes.

For Flue-cured tobacco, the larger crop and smaller carryover mean a 1978-79 supply above 1977-78. This season USDA maintained the Flue-cured quota to keep supplies adequate. Growers are selling about 7 percent more than in 1977 with yields per acre helped by improved weather conditions.

The 1978 Flue-cured auction season has just ended with a record average of \$1.36 per pound, 18 cents above the previous year. Quality was substantially improved particularly in areas where growers left less desirable down stalk leaf in the field.

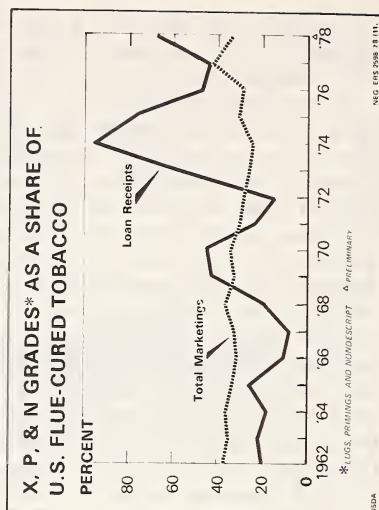
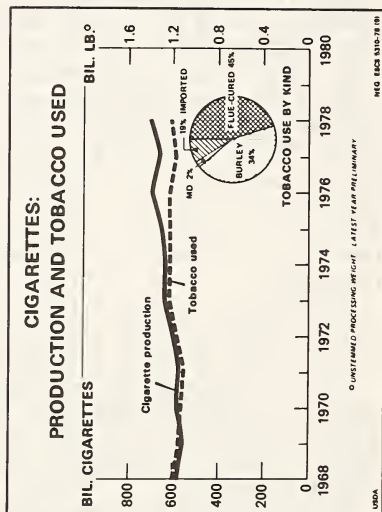
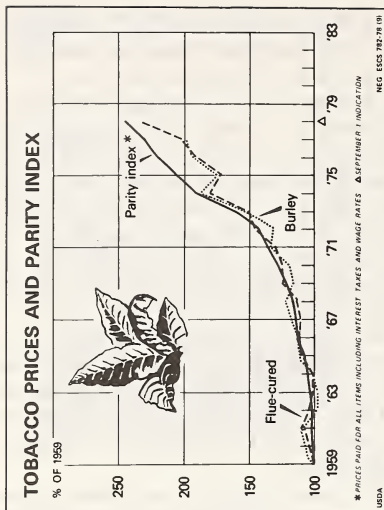
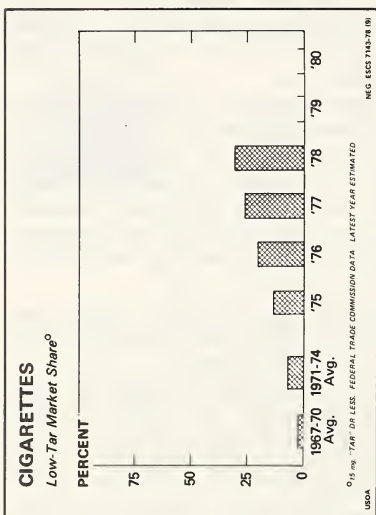
For 1979, under the acreage-poundage program, USDA is required to announce the national Flue-cured marketing quota by December 1, 1978. The 1978 quota was 1,116 million pounds, or the same as the previous season's use. Supplies are about 2.8 year's use compared with the desired supply of 2.5 years, according to the legislative formula. The effective quota for 1979 will likely decrease from the past season's level due to overquota marketings in 1978 exceeding underquota marketings.

The 1978-79 supply of Burley tobacco is slightly above last season. Carryover on October 1 was up slightly. This year's crop is up 1 percent. Acreage is down slightly but yields are higher.

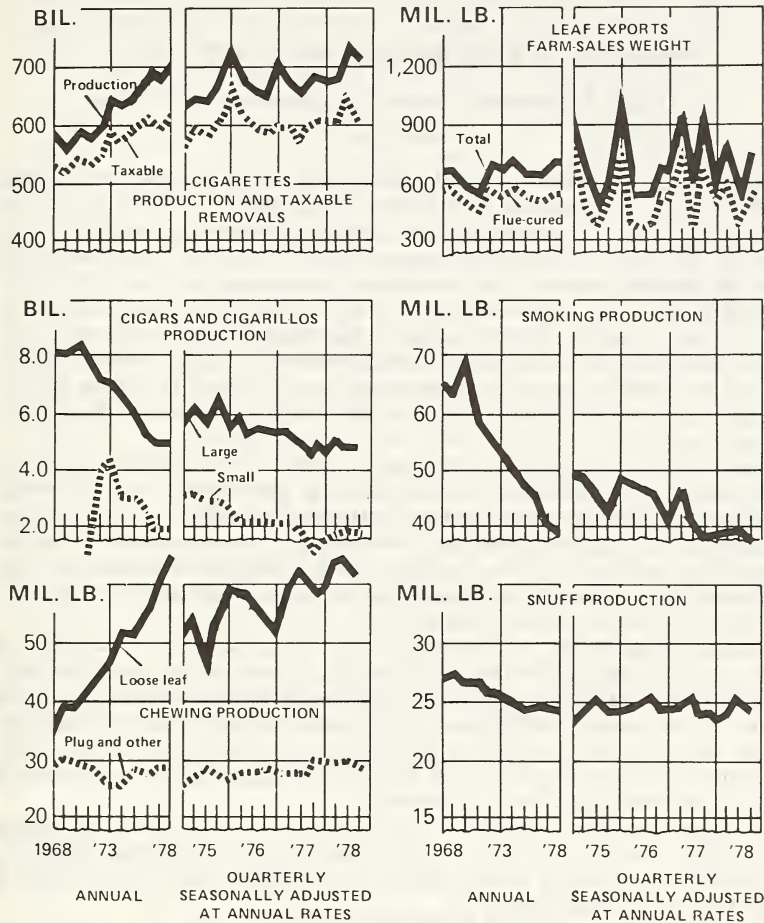
Burley disappearance may have been maintained in 1977-78 when exports rebounded after last fall's dock strike. In 1979, domestic Burley disappearance may remain large with ample supplies and further growth in exports. Carryover stocks next October 1 likely will change little.

Burley poundage legislation requires that the national quota be not less than 95 percent of estimated disappearance for that year. With disappearance around the 610 million pounds for the past 3 years, USDA may keep the 1979 Burley marketing quota near this season's 614 million pounds. The 1979 farm quota will include the indicated undermarketings from this year's quotas.

Supplies of Southern Maryland and Fire-cured tobacco are larger than last season. Supplies of Dark air-cured, and cigar tobacco are about the same size this season.



TOBACCO OUTLETS

Trends in Manufactured Products and Exports

USDA

LAST QUARTER SHOWN ESTIMATED.

NEG. ESCS 229-78 (9)

WORLD OUTLOOK FOR FOOD GRAINS

(By Donald J. Novotny, Foreign Agricultural Service, USDA)

Not all of the figures are in yet, but at last count it appears that the world wheat and rice crops for 1978 will be more than 50 million tons above a year ago. Wheat alone is up more than 40 million and rice is up by more than 10 million. This past year, for the first time in many years, there was a set-aside for wheat in this country with the objective of helping to avoid excessive buildup of world wheat stocks. But in spite of our set-aside, it now appears that the global stocks buildup for wheat will be on the order of 15 million tons; without our set-aside, the buildup would merely have been another 5 or 6 million tons larger. For rice, too, a stocks buildup is in the making, not only here, but overseas as well.

Against such a background of large supplies, it is difficult to characterize the general outlook for food grains in worldwide terms. But all of us have learned by now, especially from the events of recent years, that we can be easily mistaken if we allow our assessment to be influenced too much by the situation which happens to evolve in one particular season. In my view, the key word in this year's world outlook for food grains is "confidence."

Over recent months, we have seen developing a kind of confidence in the world situation for food grains. There is a certain confidence in continued growth of the needs of importing countries. There has been a kind of increasing confidence in the new farmer reserve program. Among our own farmers, there has been a persistent confidence that they can hold their supplies, and that other exporting countries won't simply take away our foreign markets.

Of course there are words with different shades of meaning. Some might prefer the term "faith," others might say it is mostly "guts," and still others perhaps would use the more timid word "hope." But I prefer the term "confidence."

There is another aspect of confidence, and that relates to our knowledge of the market, of how to tell short-term occurrences from more basic ones, and our understanding of how production and usage react to different developments. In still another way, there is a confidence in our ability to work along commodity lines with other countries, to at least understand them better, and possibly even to do things more in harmony; our market development programs also play a very important part in this area of knowledge, understanding, and working together with foreign countries.

Fundamentally, in all of these forms of confidence, we are dealing with the global, longer term balance between supplies and requirements. The tools that are available for adjustment, and the market systems within which the world wheat economy operates are a long way from perfect. But the world does have a certain ability to seek a reasonable balance between supplies and requirements of food grains,

a kind of balance that provides returns that growers must have and at the same time provides a dependable, ongoing supply to meet the needs of consumers around the world. I believe that such ability has improved considerably in recent years, and that it has not been significantly altered by the circumstances of the current season, and therefore, I tend to feel that confidence is an appropriate key word.

At this stage I will turn to a few specific remarks on rice, and then come back to more detailed discussion on wheat.

The 1978 world wheat crop has in my view benefited from extraordinarily good weather. Very few countries experienced poor wheat-growing weather. This can be shown with the following table.

If global wheat yields this season had been in line with the trend of recent years, the total outturn would have been smaller by approximately 5 percent or 22 million metric tons. Conceivably it could be argued that higher world prices, or some new technology changes should have caused us to expect a yield higher than the trend figure, and on this basis it might be argued that the extra 22 million tons is not entirely due to unusual weather. I would doubt this. I believe that if there was a basis for some new burst of technology at the global level, or if there was some response to increased levels of world prices it would not have waited until 1978 to emerge. Instead, it would already have come forward in earlier years, 1973, 1974, 1975, and so on. If anything, there may well have already been such extra increase in yields during those years which is already influencing the trend calculation unduly for purposes of extrapolation. I realize that shifts toward higher yielding varieties continue to occur in some countries, but my feeling is that at the global level the jump occurring in wheat yields this year purely because of unusual weather is certainly not understated by referring to a trend indication, and if anything it is perhaps understated.

Let me now review the global totals for supplies and requirements for wheat this year as we presently see them.

WORLD WHEAT—MILLION METRIC TONS

	1976-77	1977-78	1978-79
Production.....	415	382	422
Utilization.....	380	399	407
Carryout.....	98	81	96

WORLD WHEAT YIELDS, BY AREA

	World	United States	World, excluding United States	U.S.S.R.	Competitors ¹	West Europe	Others ²
Yields (tons per hectare):							
1968-69.....	1.46	1.91	1.41	1.39	1.34	2.64	1.21
1969-70.....	1.42	2.06	1.36	1.20	1.44	2.60	1.21
1970-71.....	1.52	2.09	1.47	1.53	1.43	2.56	1.25
1971-72.....	1.64	2.28	1.57	1.54	1.49	2.98	1.35
1972-73.....	1.63	2.20	1.57	1.47	1.32	3.04	1.43
1973-74.....	1.72	2.12	1.67	1.74	1.54	3.14	1.41
1974-75.....	1.62	1.83	1.60	1.41	1.42	3.39	1.44
1975-76.....	1.56	2.06	1.49	1.07	1.61	3.15	1.45
1976-77.....	1.79	2.03	1.75	1.63	1.74	3.08	1.61
1977-78.....	1.69	2.06	1.64	1.49	1.68	3.21	1.55
Preliminary 1978-79.....	1.87	2.13	1.84	1.83	1.68	3.57	1.61
Trend 1978-79 ³	1.77	2.05	1.71	1.50	1.61	3.40	1.63
1978-79 area (million hectares).....	226.0	22.9	203.1	62.8	25.3	16.0	99.0
Deviation (million tons).....	+22.6	+1.8	+26.4	+20.7	+1.8	+2.7	-2.0

¹ Canada, Australia, Argentina.

² World excluding United States, U.S.S.R., competitors, West Europe.

³ Based on 10-yr trend, 1968-69 to 1977-78 extrapolated to 1978-79.

As already indicated, with the current projections, we should expect roughly 15 million tons to be added to global carryover stocks by the end of the current marketing season. Several things should be mentioned about the prospective global carryout level. First, as a percent of utilization, the carryout remains far below the levels which were experienced prior to 1972. Second, a large part of that stock increase is likely to center in the Soviet Union, where wheat stocks are believed to have been quite low until this year. Third, and perhaps most important, we should remember that if yields this year had merely been at the trend level there would have been a decrease in stocks in the current year, and that if yields had been below trend by 22 million tons, instead of above by that amount, the global carryout figure would certainly have fallen to something below 70 million tons. At that level, when related to the increased level of world consumption, they would have been as low as at any time in the 1972-75 period.

The point could now be made that, after all, yields next year might again be above trend as they were this year, in which case another 15 million tons would be added to stocks. But here is where the word "confidence" becomes even more important. First, there is a strong probability that that will not happen. And second, in my view there is an equal probability that even if that does happen, there will be another combination of years to follow where yields will fall short of the trend by just as much. Suppose, instead, that the next 2 years were to experience sharply below-trend yields at the global level; certainly, in that event we would again see carryover stocks as low or lower, in relation to utilization, than what was experienced in 1975/76.

Another consideration is planted area. But area is hardly increasing at all, which tends to verify our giving primary attention to yields.

WHEAT—HARVESTED AREA, IN MILLIONS OF HECTARES

	1976-77	1977-78	1978-79
Argentina.....	6.4	3.9	4.6
Australia.....	9.0	10.0	10.1
Canada.....	11.3	10.1	10.6
Subtotal.....	26.7	24.0	25.3
U.S.S.R.....	59.5	62.0	62.8
People's Republic of China.....	28.5	27.5	27.6
West Europe.....	16.4	14.8	16.0
East Europe.....	10.3	10.0	10.2
Turkey.....	8.6	8.4	8.6
India.....	20.5	20.9	21.0
Others.....	33.3	31.2	31.4
United States.....	28.7	26.8	22.9
World total.....	232.5	225.6	225.8

The next point in the analysis relates to utilization. Here we have only tentative projections for the 1978-79 season, but we can see from historical data that this element is quite predictable. Feed utilization fluctuates somewhat, and we are already looking for a relatively low level for 1978-79, so the increment in total utilization which appears in our projections is already somewhat smaller than could be expected from the normal increase in wheat usage for purposes other than animal feeding. Another element in the yearly fluctuation relates to the waste loss adjustment for the U.S.S.R.; here again, the 1978-79 figure is relatively low.

In general, we can expect an annual utilization increment of roughly 12 million tons at the global level. Meanwhile, our trend figures for

global wheat yields show that we can expect an annual increase of about 2 percent, which, unless there is an increase in plantings, represents a yearly production increase of only about 8 million tons. Thus, there is a fairly close balance between the growth in usage and the growth in supply when the effect of fluctuating weather conditions is removed. In fact, the difference between 12 and 8 would suggest that unless there is a slowdown in foreign usage, or a pickup in foreign area or yields, none of which really seem likely, it ought to be possible within a relatively few years to stop worrying about production restraints. Again, this would seem to support the view that "confidence" is a reasonable way to characterize the world wheat outlook.

Against this background of general analysis, there are some important special features of the world wheat situation which merit coverage. Work toward the new wheat agreement has already been discussed during sessions earlier this week, but it needs to be mentioned in this context that if a new agreement emerges, and becomes effective next summer, it could have a bearing on the short-term outlook. If the agreement commits all countries to put aside certain reserves, it could well be that some of those countries would not have those reserves in hand at the time the put-aside is to take place. To such extent, there would be some additional world demand for stock-building purposes during 1979-80. Another aspect of the agreement which is being discussed relates to the joint program of supplementary adjustments which member countries might undertake as a backup, in the event that triggering of the joint reserves acquisition program does not, by itself, arrest a downward movement of prices. It could be, for example, that in such a situation there would be plans for member countries jointly to undertake a certain degree of production restraint. This also would represent an addition to the world's ability to try to maintain a reasonable ongoing balance between world supplies and requirements.

The question of burden sharing by other countries, whether or not dealt with in a new wheat agreement, will probably draw increased attention in light of the additional accumulation of world stocks taking place in 1978-79. It seems that a strong case exists for other countries, particularly the exporters of wheat, to undertake a share of the task of helping to avoid an excessive short-term accumulation of global stocks. It is in their interest, and they have done this type of thing before, so it will be interesting to watch for the steps that might be taken.

Another, somewhat related factor in the outlook, which is a particularly difficult problem at this time, is the practice of subsidized wheat exports by some countries. The European Community currently has a standing export subsidy of over \$100 per ton for its surplus soft wheat, and there are reports that in certain instances subsidies have been granted as large as \$125 per ton. The case with the European Community is especially complicated because their subsidies on wheat, which may well cost them close to \$1 billion this year, are financed in part by their import levies on our shipments of durum and hard wheats, which hold down the usage of those wheats in Community countries.

U.S. FOOD GRAINS OUTLOOK

(By Thomas E. Elam, Agricultural Economist, Economics, Statistics, and Cooperatives Service, USDA)

WHEAT OUTLOOK

Reduced U.S. production and supply

Heavy participation in the set-aside program coupled with extremely wet planting conditions in Soft Winter areas last fall reduced 1978 U.S. wheat production to 1.78 billion bushels. This is 12 percent below the 1977 crop and the smallest since 1973. With a June 1, 1978, carry-in of 1.18 billion bushels, the U.S. wheat supply for 1978-79 totals 2.96 billion bushels, or 6 percent less than the 1977-78 supply.

Food use stays strong

Mill use of wheat this year has been running above 1977-78 levels. Although flour exports have also been up, apparent domestic food consumption has been running slightly above last year's record level. Long-term growth in food demand is probably related to overall economic growth, more sales of convenience foods, and some growth in the population.

Food use for 1978-79 is projected at about last year's record 569-million-bushel level.

Feed use may be cut

As wheat prices increase to levels well over competitive feed grains, wheat feeding should drop sharply. However, feed and residual use for June-September 1978 totaled 138 million bushels, almost unchanged from the same period last year. Although there was considerable sprout damage to Western White, a lack of early season weakness in apparent feed use is likely the result of the residual nature of this estimate. For the 1978-79 marketing year wheat feeding is estimated at 125 million bushels, compared to almost 200 million in 1977-78. This estimate implies a negative feed and residual use for the balance of the crop year.

Export movement heavy

U.S. wheat exports started the 1978-79 marketing year at one of the fastest clips on record. June-October shipments totaled about 600 million bushels, the second heaviest on record for a similar 5-month period. Much of this strength resulted from shipments to two customers.

The People's Republic of China (PRC), not ordinarily a purchaser of U.S. wheat, has bought about 3 million tons for 1978-79 delivery. Brazil has also bought more wheat than usual from the United States. Normally, these two countries fill most of their needs with purchases from Canada, Australia, and Argentina, but production shortfalls and

transportation problems have limited the competitors' ability to supply world markets.

Currently, the forecast for 1978-79 U.S. wheat exports is a range of from 1,050 to 1,250 million bushels. To date, shipments are running well ahead of the pace needed to reach the upper end of the projected range for the year, but the final outcome will depend on availability of competing world supplies versus demand in the last half of the year. Current thinking is that the U.S. export pace will subside in the coming months when Southern Hemisphere crops come to market.

With the large exports in prospect for 1978-79 and a smaller crop, ending U.S. wheat stocks will drop for the first time in 4 years. The current projection is for a June 1, 1979 carryover of 1,036 million bushels, down about 10 percent from last year's level. This ending carryover level would be 54 percent of projected disappearance versus 60 percent for last year and 65 percent for 1976-77.

About 405 million bushels of the carryover will be in the farmer-owned reserve and another 50 million in a Government-owned reserve. Thus, about 43 percent of the projected carryover would not be available to the market until farm prices advance beyond \$3.29 per bushel. In effect, only about 600 million bushels of projected ending carryover, or 32 percent of disappearance, is available for sale unless prices strengthen to over \$3.29 per bushel.

Placement of 1978-crop wheat into Commodity Credit Corporation (CCC) loan is running at a much lower pace than last year due to stronger market prices and fewer eligible farmers this year as compared to last. As of mid-October, loans on 1978-crop totaled about 170 million bushels compared to 418 million by the same time last year. Strengthening cattle prices may have also eased the financial burden on some Great Plains wheat producers with feedlot or cow-calf operations, lessening the need for operating loans.

Wheat prices recover

Wheat prices have continued the recovery from the extremely low levels of the summer of 1977. Major forces which have shaped this trend are: (a) the acreage-reducing 1978 set-aside program; (b) weather-related problems in the Soft Red Winter areas; (c) large entries into the farmer-owned reserve; and (d) a heavy rate of exports since late 1977.

Prices received by farmers for all wheat averaged \$2.30 per bushel in October 1977 compared to \$3.04 last month. For June-October, the simple average was \$2.13 in 1977 and \$2.89 this year. Currently, USDA forecasts an average price of between \$2.80 and \$3.00 per bushel for the entire 1978-79 marketing year. Whether the actual average price is at the high or low end of this range will depend on factors such as:

Acreage and potential yields from the 1979 Northern Hemisphere winter wheat crop.

Outcomes of the upcoming Southern Hemisphere wheat harvest, which will begin later this year.

Amounts, if any, of additional Chinese and Russian purchases of U.S. wheat.

The pattern of farmer marketing and storage decisions.

Should the situation continue to favor strength, prices could approach the \$3.29 per bushel release level for the farmer-owned wheat reserve, farmers would be allowed to sell reserve wheat stocks, and

storage payments could be suspended in States where the average price exceeds the State loan rate plus the 94 cent national loan rate-release level differential.

Wheat program for 1979 little changed

On August 15, USDA announced a wheat program for 1979-80 which is not much different from the 1978-79 policy. The target price and national average loan rate remain the same at \$3.40 and \$2.35, respectively. Set-aside stays at 20 percent, but the paid graze-out program was dropped. Voluntary acreage reduction for guaranteed target price protection on 100 percent of harvested acreage was reduced to 15 percent from 20 percent. The voluntary reduction applies to acreage "considered planted" in 1977-78. "Considered plantings" are the total of set-aside, haying and grazing and acres planted for harvest.

OUTLOOK BY CLASS

HRW crop down but supply still large

The 1978 Hard Red Winter (HRW) wheat crop of 842 million bushels was about 150 million below last year, and the smallest crop since 1972. Generally the quality of the 1978 HRW is considered good, with proteins slightly below last year's high level but still above the 10-year average.

Despite this year's smaller crop, total 1978-79 HRW supplies are down only 8 percent from last year's record 1.6 million bushels. As of October 1, about 230 million bushels were CCC-owned or in the 3-year farmer-owned reserve program, along with another 130 million bushels of outstanding loans. Total use for the 1978-79 marketing year is projected to be in excess of the crop so ending stocks will decline below 500 million bushels for the first time since 1975-76.

HRW export commitments (shipments plus outstanding sales) are 100 million bushels ahead of last year's pace. While the rate of foreign deliveries of U.S. HRW is expected to subside as other world wheat crops are harvested, total 1978-79 exports could reach 600 million bushels, the largest since 1973-74.

Prices have been strong, particularly for the lower protein levels, reflecting tighter overall supplies and the shortage of the lower protein Soft Red Winter wheats. October farm prices have advanced, with frequent farm prices above \$3.

SRW supply off sharply

Domestic Soft Red Winter (SRW) users face a tight supply/demand situation in 1978-79 with a sharply reduced supply only slightly larger than total demand prospects. However, the rise in SRW prices relative to other classes will serve to ration supplies among users. Substitution of lower protein HRW wheats may fill some of the domestic and export SRW demand. Nevertheless, total disappearance will likely exceed the harvest, resulting in a stock drawdown to minimum pipeline levels by the end of the crop year.

Harvest prices of SRW held slightly above \$3 per bushel. Continued concern with tight supplies has further strengthened Chicago SRW prices to above both Kansas City HRW and Minneapolis HRS. October SRW farm prices are running substantially above \$3 per bushel, almost \$1.25 higher than a year ago.

HRS exports strong, supplies large

Current estimates place the 1978 Hard Red Spring (HRS) harvest at about 5 percent less than last year. Crop quality appears to be generally good, with protein levels about 1 percentage point below a year ago. Despite the smaller 1978 crop, the total 1978-79 HRS supply will be over 700 million bushels. While this is more than 2 years' normal use, a total of about 200 million bushels were CCC owned, under loan, or in the 3-year farmer-owned reserve.

Domestic use may show some increase from the 1977-78 level with lower protein spring wheats being substituted for SRW. At the lower protein levels, HRS is trading well below prices for soft and hard winter wheats.

HRS exports are projected at 180 million bushels, about 15 percent above 1977-78, but total export commitments as of October 22 were 115 million bushels, up a third from a year ago. Export sales were particularly strong to Western Europe and several Middle East countries. Continued strong sales may well depend upon available supplies from competing countries, particularly Canada.

Prices of HRS have moved upward, but the typical price premium paid for HRS over HRW has about disappeared due to the large HRS supplies relative to HRW.

Durum supply up for 1978-79, early exports very strong

Durum production in 1978 recovered from the short crop of 1977 because relatively strong Durum prices encouraged growers to increase 1978 acreage about a third. The 1978 harvest was up nearly 60 percent from 1977, and the second largest crop on record. Good overall quality is reported for most of the 1978 Durum crop.

Despite carryover of old-crop being down a fourth, this year's bumper crop will push 1978-79 Durum supplies up about 10 percent, to near the 1976-77 record of 190 million bushels. Only about 9 million bushels have been placed in the 3-year farmer-owned reserve program. Prospects for whittling down these huge supplies are not bright, since projected disappearance is expected to only match last year's level. Carryover next year could be up nearly a third.

Early season mill grind is running behind last year's brisk pace, but the pressure of large supplies should favor a modest increase in 1978-79 domestic use.

Exports are expected to nearly match last year's, but all major producing countries are expected to have larger 1978-79 Durum crops, indicating increasing competition later this year. Heavy early-season buyers have included North Africa, Italy, France, and East Germany.

Despite the large U.S. and world supply, Durum prices were steady at \$3.50 per bushel through harvest. Large early-season export sales and prudent producer marketing may hold prices steady through the first half of the marketing year.

White wheat crop up; exports expand

In all, 1978 White wheat production was up about 10 percent from 1977. Combining reduced carryover stocks and production places total 1978-79 White wheat supplies about equal to last year's 309 million bushels. About 15 million bushels are in the farmer-owned reserve.

Generally, this year's crop has good milling and baking properties, but rains during harvest caused varying degrees of sprout damage to

nearly 20 percent of the Western White. The most severely damaged portion most likely will have to be fed to livestock.

Total 1978-79 domestic use is expected to be up slightly on the strength of feeding this sprout-damaged wheat. However, exports account for about three-fourths of total use. Export shipments to date are about a fifth more than the same period last year, and in October outstanding sales were up nearly 50 percent. This strong tone would seem to indicate total White wheat exports could exceed 1977's 174 million bushels. All of the 1978 crop should be utilized, and a stock drawdown may be expected.

Prices of No. 1 White at Portland, around \$3.75 per bushel, have maintained strength through the 1978 harvest. This is partly a reflection of overall advance in this year's wheat markets because of strong export demand and producer holding. Traditional premiums of White over SRW prices have been halved, favoring some increased demand for the Soft White supplies.

OUTLOOK FOR 1979 WHEAT PLANTINGS

Acreage planted to wheat for harvest in 1979 will depend largely on weather and the program participation decisions of farmers. Both factors seem to point to a slightly larger acreage for harvest next year.

Some seeding of the 1979 winter crop was delayed because of dry soils, but widespread light rains improved planting conditions and germination. However, moisture shortages still threaten areas that need growth before going into dormancy. The Soft Red Winter area in particular is enjoying much improved weather this year. At least some of the 2.2-million-acre reduction in last year's wheat plantings in Illinois, Indiana, Ohio, and Missouri will likely come back into wheat production this year.

Elimination of the paid graze-out and a cut in the voluntary reduction provision of the 1979 program may also encourage additional wheat acreage. In 1978, 1.4 million acres were enrolled in the paid graze-out, and some of these acres might be harvested for grain next year. Also, with wheat prices high relative to sorghum, barley, and oats, the smaller voluntary reduction requirement for wheat might encourage participating farmers to take more set-aside out of these feed crops and less from wheat.

Finally, with market prices higher relative to the target price of \$3.40, the incentive to participate in the program may have been diminished. Lower participation would tend to show up as an increase in harvested acreage.

However, wheat producers have generally supported Government supply-management programs. Disaster and low yield features of the current wheat program are attractive to many Great Plains growers regardless of market prices. Overall, participation should be fairly close to 1978's level of around 70 percent.

Net wheat acreage harvested in 1979 will likely rise somewhat from this year's level of 56.5 million acres.

RICE OUTLOOK

A year ago the outlook for U.S. rice producers was marked by relatively short supplies and prospects for the highest prices in

several years. Now, the outlook is a mirror image—large supplies and weaker prices.

Acreage, production, and supplies up sharply

Responding to the high prices of 1977-78, U.S. rice producers planted 3.0 million acres last spring, up 0.8 million, or 34 percent, from 1977. Acreage was up in all six producing States, but the largest increase was in Arkansas. California growers planted an additional 200,000 acres in part because water supplies returned to normal after the 1977 drought.

Although acreage was up sharply, average yields were as good or better than 1977 levels. Normally, increasing acreage tends to reduce average yields because the marginal acres tend to be less productive. For 1978, yields will average about 4,500 pounds per acre, up 100 pounds from 1977 and very near the average for the past 10 years.

Yields were up in every major producing State except California where heavy spring rains delayed plantings. The crop developed at a normal pace, and was harvested under almost ideal conditions. As a result, average quality should be up this year.

Although August 1, 1978 stocks dropped to levels well below the last 2 years, the record crop will push supplies to an all-time high of about 165 million hundredweight (rough equivalent). Prior to this year the record supply was 153 million hundredweight in 1976-77.

Supplies of all classes of rice will be up in 1978-79. August 1 carry-over stocks of long and medium grain were down, but short grain up. Acreage and production of all three classes set a record in 1978.

CCC rice inventories totaled about 11 million hundredweight on August 1, down 8 million from a year earlier. Reduction in CCC-owned rice inventories during 1977-78 was possible because prices rose above resale levels. Also, none of the 1977 crop placed under loan was turned over to CCC. But with larger supplies and lower prices, CCC stocks may build up again at the end of 1978-79.

Domestic use

Preliminary data show domestic rice use down substantially in 1977-78. Civilian food consumption, a residual derived from reported stocks, production, exports, shipments, seed, and brewers' use, was down about 5 million hundredweight (rough equivalent), or 22 percent, in 1977-78. This reduction is contrary to the long-term uptrend in U.S. food consumption of rice and cannot be explained by physical shortage or high prices. It is assumed that 1978-79 food use will return to the trend level. Brewers' use was also reduced in 1977-78, but the drop may be explained by high rice prices in relation to alternative grains. For 1978-79, domestic use is expected to total about 44 million hundredweight (rough equivalent) up from 37.6 last year.

Exports may drop

U.S. rice exports may decline slightly in 1978-79, as compared to 1977-78. A record world crop will tend to keep world trade below last year's high level. Indonesia will likely take a considerably smaller volume, but exports to several Middle Eastern and African countries are expected to be largely offsetting.

Export sales of 1.1 million metric tons (milled) as of mid-October were slightly ahead of last year. Early season buyers have included the EC, Iran, Saudi Arabia, and Nigeria.

Total U.S. rice exports for 1978-79 are projected at about 2.1 million tons (milled), down about 18 percent from last year. Commercial sales are expected to slip by more than the overall drop in exports while Public Law 480 shipments are expected to rise by around 20 percent to about 685,000 tons. Much of the increase in Public Law 480 exports is carryover from sales made, but not delivered, in 1977-78.

Prices reflect record supply

Coming off last year's limited supply situation, by mid-October farm prices for rough rice dropped to \$7.58 per hundredweight, or about one-third below the February 1978 peak of \$11.30 paid for last year's crop. Price weakness was evident for all classes and areas, but California prices did not drop as rapidly as those in the South. Farm prices for the 1978-79 marketing year are expected to average between \$6.50 and \$7.50 per hundredweight.

Average prices in August-December 1978 will likely fall below the \$8.53 target price. Deficiency payments thus appear likely for the holders of the 1.8 million acres of rice allotments.

Program developments

USDA is currently formulating the framework for the 1979 rice program. A proposed rulemaking will be published in the Federal Register. Comments will be invited on the manner of implementing a set-aside and land diversion payment program as well as the levels of the target price and loan rate. After evaluating public reaction to the proposal, it is hoped that a final program can be announced by late December or early January.

A farmer-owned reserve program for rice was announced on September 20, 1978. Farmers holding allotments can place up to 8 million hundredweight of rice into the reserve. Producers will receive storage payments for rice placed in the program. The reserve rice can be sold if the national average farm price surpasses \$8.96 per hundredweight—140 percent of the national average loan rate.

Early outlook for 1979

Low market prices for rice, and a brighter outlook for soybeans and cotton, may encourage a smaller area planted to rice in 1979. The 1979 program could also have an impact on planted acreage. It appears that acreage could slip moderately from the record level of this year.

WORLD SITUATION AND OUTLOOK FOR FEED GRAINS

(By James P. Rudbeck, Agricultural Economist, Foreign Agricultural Service,
U.S. Department of Agriculture)

WORLD SITUATION AND OUTLOOK FOR FEED GRAINS

World trade in feed grains in 1978-79 will likely rise for the fourth consecutive year to a record volume, even with world production estimated at an alltime high. Import demand for feed grains continues to grow in countries where rising requirements outpace domestic production. Increased utilization, however, will not be sufficient to preclude a rise in world stocks. Over half of the increase in global stocks is likely to occur in the United States, but stocks outside of the United States are projected to grow to the highest level ever.

WORLD FEED GRAIN SUMMARY

[Million metric tons]

	1974/75	1975/76	1976/77	1977/78 preliminary	1978/79 forecast
Beginning stocks	64	58	56	76	82
Production	628	644	702	694	732
Total supply	692	702	758	770	814
Utilization	633	646	682	688	709
Ending stocks	58	56	76	82	105
World trade	64	77	82	83	86

Despite the prospective increase in world feed-grain supplies, prices have remained firm and in fact are even above levels of a year earlier. One important factor behind this price strength is recent large purchases of corn by the People's Republic of China. Some countries may also be taking advantage of the recent decline of the U.S. dollar to increase utilization and/or stocks. Other factors may include farmers' withholding of grain from the market and the sizable entry of grain into the U.S. reserve program. Factors in the United States have a significant bearing on world price movements. Although the United States accounts for about 30 percent of world production and 20 percent of utilization, it currently supplies over 60 percent of world trade, and U.S. stocks have grown to represent about half of the world total.

Production record large

The Northern Hemisphere feed-grain harvests are nearly completed, but a degree of uncertainty still surrounds the Southern Hemisphere crops which account for about one-tenth of the world total. The current estimate for the 1978-79 world feed-grain harvest is 732 million metric tons.

If final world production proves to be around this level, it will be 30 million tons or 4 percent higher than the previous record of 1976 and 38 million tons or 5 percent over last season's outturn. Corn production accounts for about half of the global feed grain total, barley about a quarter, grain sorghum one-tenth, and oats and rye the balance.

This season is proving to be highly unusual because there are no signs of significant crop shortfalls in any areas of the world. Record or bumper feed-grain crops are possible in the United States, Canada, the U.S.S.R., the European Community, the People's Republic of China, Thailand, Australia, Brazil, and India, which in total account for two-thirds of the world total.

The only notable areas where feed-grain production might not match the levels of a year earlier are East Europe, Argentina, and South Africa. In the latter two Southern Hemisphere countries, yields were unusually high last year, and the projections assume a return to more normal yields this season.

Utilization highest ever

Current estimates indicate that world utilization of feed grains in 1978-79 will rise by about 20 million tons to a record 709 million tons. The average annual rate of increase over the past 5 years has been around 12 million tons.

Increased livestock numbers in some countries, combined with more intensive feeding in these and other areas, largely account for this rise in world utilization. Some countries may also be taking advantage of the recent decline in the U.S. dollar and the increased spread between the price of wheat and corn to increase the utilization of corn, in some cases, for human consumption as well as for animal feeding. Approximately 60 percent of worldwide corn, barley, grain sorghum, oats and rye utilization is for livestock feeding, while human consumption—particularly in areas of South America, Asia, Africa, the U.S.S.R., East Europe, and the People's Republic of China—accounts for around 30 percent. The balance is for industrial uses and seed.

Aside from the United States, increased utilization is expected in the Soviet Union, East Europe, the PRC, and a number of "middle-income countries" such as the Republic of South Korea, Taiwan, Iran, Venezuela, and Mexico. Growth of feed-grain utilization, however, could possibly slow down in the two major importing markets—the European Community and Japan. In the European Community, where nongrain feedstuffs such as manioc enter feed rations at a price advantage to grains, feed-grain utilization may remain stable. Japan's utilization should grow, but the rate of increase will depend on the Government's decision on the disposal of surplus rice. If some of this rice is offered to feed compounders at subsidized prices, it could slow down the rate of increase in grain usage.

Imports rising to new heights

World trade in feed grains this season is expected to rise to new heights, the fourth consecutive year that trade has continued to increase. In 1975-76, trade was boosted by large Soviet imports; in 1976-77, West Europe came into the market for unusually large purchases; and in 1977-78, Soviet buying was again a contributing factor to expanded world trade.

In 1978-79, prospects for a further rise in world trade are supported by the emergence of the PRC as a significant buyer of corn and the expectations that the U.S.S.R. will maintain large imports.

The PRC has already purchased 1.5 million tons of U.S. corn plus smaller amounts of Argentine and Thai corn. These are the first significant import purchases of corn by that country since 1973, and come at a time when overall domestic grain production is estimated to be increased over last year. In light of the extensive use of corn for human consumption in China, one possible factor in these recent corn purchases is the increasing world price spread which may be encouraging purchases of corn over wheat.

Despite this year's record grain harvest in the Soviet Union, the corn component which is normally relatively small, will be reduced. Since corn appears to be gaining in favor in feed rations, this suggests continued large corn imports.

Underlying the overall expansion in world trade, however, have been continually and steadily larger imports by other areas of the world such as Japan, East Europe, the Republic of South Korea, Taiwan, Iran, Venezuela, and Mexico. There are other countries that are also importing increasingly larger quantities of feed grains as well, but the latter five countries are currently importing at least 1 million tons per year, and three have crossed the 2 million-ton mark. This underlying strength in world import demand will carry into the current year as domestic production in these and other areas cannot keep pace with requirements.

The European Community, which accounts for around 20 percent of world feed-grain imports, might reduce its volume of imports due to burdensome local supplies and continued competition from non-grain feedstuffs. In some EC countries, however, corn utilization is already at minimal technical levels in feed rations, and further displacement by either nongrain feedstuffs or local barley may encounter difficulties.

Export competition to intensify

World trade in feed grains in 1978-79 may rise, but competition will be more intense than this past year. Based on the harvests completed in the Northern Hemisphere and early season prospects in the Southern Hemisphere, exports from the major foreign exporters—Argentina, Canada, Australia, South Africa, Brazil, and Thailand—might be close to 10 percent higher this year than last year. In addition, exports of EC feed grains, which increased about 35 percent this past year, might be sustained at close to the same level.

In the Northern Hemisphere, Canada's barley crop was slightly less than last year, but farmers were already holding record stocks. The Canadian Wheat Board will be under pressure to boost barley export following a dropoff last year.

The EC barley crop is estimated to be a record for the second consecutive year and heavily subsidized exports have already begun to appear on the world market.

Thailand's production of corn recovered this year and is estimated to be about 60 percent over the previous year's poor harvest. Exports are expected to increase and sales have already been reported to such nontraditional markets as the PRC, North Korea, and Vietnam.

Taiwan and Japan are also negotiating contracts with Thailand, and have been historically the two largest markets for Thai corn.

In the Southern Hemisphere, the barley crop that is now being harvested in Australia is estimated to be the highest ever. Increased exports of barley are expected from that country in the months ahead, particularly to Japan.

The 1978 South African corn crop was a near record, but because of internal transportation limitations on bringing the crop to the ports, exports will be extended well into 1979 even if the next harvest is reduced. The area under corn in South Africa does not change much from year to year and annual production variations are due to weather. Even if yields for the coming harvest are lower than in past years, South Africa will be able to export larger quantities in 1978-79 than during the previous season.

The recent Argentine corn and grain sorghum harvests were favored by excellent growing conditions. Exports were high in the months following the harvest, but have begun to decline awaiting the next crops which are currently being planted. The area planted to both crops may be more or less maintained, and if yields do not equal the records of this past year, exports during the 1978-79 season might decline slightly.

Brazil's corn crop earlier this year was struck by drought and was nearly 25 percent lower than the 1977 outturn. Domestic feed demand has been growing in recent years, and imports of at least 1 million tons will be necessary this year as opposed to exports of about the same magnitude in recent years. High prices as a result of this year's shortfall are expected to encourage producers to increase corn plantings. If weather conditions are favorable, exports could be resumed around mid-1979.

Stocks rising

Global stocks of feed grains are projected to rise during 1978-79 by around 23 million tons. By the end of the season, stocks could be at a level equivalent to about 15 percent of utilization. The stocks-to-utilization ratio hit a low in 1975-76; and although it has increased since, it is still well below the early 1960's, when in most years global stocks were the equivalent of at least 20 percent of utilization. Stocks outside the United States could grow to a record, but as a percentage of foreign utilization would be only around 9 percent, which is below the early 1960's.

Outlook for the balance of 1978-79

Some of the more important developments that will have impacts on the world feed-grain outlook and U.S. exports over the balance of this season are:

- Further purchases of corn by the PRC;
- The ultimate level of purchases by the Soviet Union;
- The outcome of the Southern Hemisphere corn and grain sorghum harvests;
- EC-subsidized export selling of barley;
- The aggressiveness of Canadian and Australian barley export sales;
- Shifting by either the U.S.S.R. or East Europe from corn to barley imports;
- Japan's decision on the disposal of surplus rice;

Program announcements in the United States and indications of farmers' participation; and

Early indications of the next season's supply and demand outlook such as planting intentions or conditions and winter crop progress in Northern Hemisphere areas such as the U.S.S.R. and West Europe.

Implications for U.S. exports

U.S. feed grains exports have started off the 1978-79 season strong. Exports of corn during July-October were approximately 40 percent ahead of the same period a year earlier. Outstanding sales as of early November were about equal to those on the same date last year. The large sales to the PRC and Brazil are major factors in this strong start.

For the season as a whole, the atmosphere confronting U.S. feed-grain exports appears to be one of strong and increasing world import demand, but potentially more competition from other exporters than in recent years, including more competition for U.S. corn from other countries' barley. Nonetheless, U.S. feed grains exports are currently projected to rise slightly during the July-June world marketing year and be the second largest volume on a crop-year basis.

OUTLOOK FOR FEED GRAINS

(By Paul Meyers, World Food and Agricultural Outlook and Situation Board,
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SUMMARY

Current farm prices for feed grains are well above a year ago in spite of record production and supplies for the 1978/79 marketing year. Prices are running about a fifth above depressed year-earlier levels, and have strengthened further in recent weeks. The strong export and feed demand and heavy placement of grain in the reserve program are the primary reasons for this price strength. Corn prices for the year are expected to average between \$1.95-\$2.15 per bushel, slightly above the 1977/78 level.

Feed grain production for 1978 is forecast at a record 209 million metric tons, nearly 8 million tons (4 percent) over 1977. With the harvest nearly complete, it is likely that the final production estimate would fall in a 205 to 215 million metric ton range. With the larger carryover, feed grain supplies will likely total a record 250 million tons, up nearly 8 percent over 1977.

Total utilization of feed grains in domestic markets and for export is forecast at a record 199 million metric tons, up 3½ percent over 1977. Feed use is expected to be up about 7 percent because of favorable feeding margins for most classes of livestock and poultry. Exports should approach the record 56 million tons exported in 1977/78. However, total use estimates could vary between 190 and 210 million tons depending on final world production estimates, import requirements of other countries, and the rate of expansion in output of fed cattle, hogs, and poultry.

Feed grains in the farmer-owned reserve totaled over 14 million tons by the end of October. Nearly 440 million bushels of corn had been placed in the reserve with placements averaging nearly 30 million bushels a week over the past 2 months. The goal of 17 to 19 million metric tons will likely be met by December 1978.

FEED GRAINS

Feed grain supplies record large

Feed grain stocks at the end of the 1977/78 marketing year totaled 40 million metric tons, 10 million above a year earlier and the largest since 1971/72. Stocks have increased 25 million metric tons over the past 3 years from the extremely small stocks carried over in 1974/75. With the larger carryover and the record 209-million-ton feed grain production for 1978, feed grain supplies for 1978/79 will total nearly 250 million tons.

Harvested acreage was down nearly 5 million acres from 1977 as a result of the 1978 feed grain set-aside and diversion programs. However, nearly ideal growing weather resulted in yields being over 8

percent greater than 1977, with the record corn yield accounting for virtually all of the increase.

Record utilization expected

Feed use for 1978 is projected at 125 million metric tons, up 7 percent over 1977, but still 10 to 15 million tons below the heavy feeding years of 1971-73. The feeding industry has still not recovered from the 35-million-ton drop in feed use from 1973/74 to 1974/75. Relatively low grain prices will likely encourage continued large placements of cattle on feed as well as further expansion in hog and poultry production. Pork producers have indicated plans for a modest increase in production. However, the rate of expansion in pork production, particularly later in 1979, will depend to a considerable extent on price developments for hogs and the cost of feed. Poultry production will likely continue 8 to 10 percent above 1978 output rates.

World demand for feed grains will expand further in 1978-79 in response to growing markets, especially to feed the increasing numbers of hogs and poultry throughout the world, and the need to rebuild depleted stocks. Even with an increase in foreign coarse grain production of around 5 percent over 1977, large U.S. supplies and the reduced value of the dollar relative to many other world currencies will likely maintain U.S. feed grain exports close to the record volume shipped in 1977-78.

Despite the favorable demand picture for the coming year, U.S. stocks of feed grains will likely increase to slightly over 50 million metric tons by the end of the 1978-79 marketing year, the largest carryover in 14 years. Given the uncertainties about the final 1978 production estimates and increases in livestock and poultry production, carryover stocks could range from around 40 million to as much as 60 million tons depending on world crop developments this winter and next summer, and the strength of domestic and world markets for coarse grains.

CORN

Production at record level

Corn production for 1978 as of October 1 is forecast at a record 6.8 billion bushels, 450 million bushels (7 percent) above 1977, and nearly 700 million bushels (11 percent) above the first estimate of the crop made in July. The major corn producing States of Illinois, Iowa, and Nebraska account for over 90 percent of the increased production in 1978, with Iowa production up 300 million bushels over 1977.

Wet conditions prevailed throughout much of the major corn producing areas this spring resulting in later-than-normal planting. However, growing conditions were nearly ideal from June until September causing the estimate of corn production to increase dramatically over the past few months. Harvesting weather has been good in most areas so that harvesting progress is running ahead of the normal pace.

The corn yield for 1978 is forecast at a record 101 bushels per acre. The record yield is the main reason for the record production since corn harvested acreage was down around 2 million acres from 1977 as a result of the 1978 set-aside and diversion programs. The 1978 yield is 10 bushels above 1977, 4 bushels above the previous record, and 12 bushels above the previous 3-year average.

Demand stronger

Feed use of corn for 1978-79 is projected at 3.95 billion bushels, up 7 percent over 1977-78. With profits in feeding the best in several years, livestock and poultry producers will be feeding more animals, and likely to heavier weights. Pork production will increase in the range of 2 to 4 percent; poultry, 8 to 10 percent; and fed beef, 5 to 7 percent.

With increases in world livestock numbers, ample U.S. supplies of grain, and relatively low prices, corn exports this year may about match the record 1.95 billion in 1977-78. The U.S.S.R. probably will not buy as much feed grain as last year if their crop increases as expected. But larger exports are likely in such markets as the PRC, Japan, and Eastern Europe.

Carryover stocks to build

Despite expected record use of corn this year, stocks will likely build again for the fourth consecutive year. Carryover stocks for next October are now projected at nearly 1.5 billion bushels, 400 million over this year's level. With such an increase, stocks would be the largest since 1964. However, there is still some uncertainty about the size of the 1978 crop, and domestic use and exports could vary widely from the levels projected. Accordingly, the carryover could range from 1.2 to 1.7 billion bushels.

Corn prices to improve slightly over 1977-78

Corn prices have remained strong despite record production and favorable harvesting weather. The October mid-month farm price of \$1.97 per bushel was about 20 percent above year-earlier levels, but nearly 15 percent below the peak prices in May and June.

There are a number of factors contributing to the strength in prices. These include:

Heavy export movement. Corn exports are running about 45 percent ahead of last year through the first month of the marketing year. Strong world demand for grain will likely persist throughout the marketing year.

A large quantity of grain isolated from the market in the farmer-owned reserve. Through the end of October, about 440 million bushels of corn had been placed in the farmer-owned reserve program, and another 20 million bushels had been turned over to the Government. In addition, there is about 200 million bushels of the 1977 corn crop still under loan. It is likely that another 75 to 125 million bushels of the 1977 crop will go into the reserve bringing the total to 515 to 565 million bushels, or about half of the October 1, 1978, stocks of corn. Corn in the reserve cannot come back on the market until farm prices reach at least \$2.50 per bushel. To date, about 70 percent of the reserve is being held by producers in Nebraska, Iowa, and Minnesota.

Generally adequate storage capacity enabling farmers to hold their grain off the market until prices improve. A recent storage survey by USDA indicated that storage facilities in many areas of the Corn Belt are adequate to handle the record supply of corn. Also, during the past year, farmers have been taking advantage

of the expanded and improved farm storage and facility loan program offered through ASCS to build additional storage capacity.

Reopening of the 1977 loan program to allow producers to put grain directly into the reserve. By reopening the loan program for 60 days, an additional 75 to 90 million bushels of corn that was not eligible for the reserve has been placed into the reserve, further reducing free supplies and helping to strengthen prices.

Likelihood of a 1979 feed grain set-aside program to reduce acreage again during 1979. Because of the record supplies, many people are expecting the 1979 set-aside program to be at least as large as the 10 percent set-aside, 10 percent diversion program that was in place during 1978.

Expansion in cattle feeding and pork and poultry production. Cattle-on-feed on October 1 were up 16 percent over a year ago, and relatively high hog prices could increase pork production more than indicated by the last *Hogs and Pigs* report.

Corn prices during the rest of the year will likely increase seasonally, but probably won't rise as sharply as they did in 1977-78 when they increased from \$1.67 to \$2.29 per bushel in just over 8 months. Farm prices will likely average between \$1.95 and \$2.15 a bushel for the 1978-79 year. A number of items will affect the movement in prices over the next few months including:

Details of the 1979 feed grain program and the level of farmer participation in the program.

The size of the Soviet crop and import requirements of major markets, particularly the U.S.S.R., the People's Republic of China, Japan, East Europe, and the European Community.

The course of inflation and value of the dollar relative to major world currencies.

Total amount of grain isolated in the reserve program.

The January 1 planting intentions report which will give the first indication of acreage shifts expected to occur during 1979.

January 1 grain stocks report which will indicate feed use during the first quarter of the marketing year.

SORGHUM

Production down sharply

Sorghum production for 1978 is forecast at 700 million bushels, down nearly 12 percent from 1977. A 4-percent decline in harvested acreage resulting from the set-aside and diversion programs coupled with a 7-percent yield decline from the high 1977 yield have caused the reduction in production. Sorghum production is forecast to be down about 75 million bushels in the two major sorghum producing States of Kansas and Texas.

Carryover stocks of sorghum on October 1, 1978, totaled 191 million bushels, 100 million higher than a year earlier. The increase in stocks will be offset by the production decline so that total supplies in 1978-79 will be little changed from 1977-78.

Feed use to increase

Feed use during June-September was up sharply from a year ago, and likely will continue strong through the 1978-79 marketing year as more cattle will be going on feed in the Southwest and sorghum prices remain low relative to wheat. Total feed use is expected to be up over 7 percent from 1977.

The sorghum export estimate of 220 million bushels is up only slightly from 1977. Foreign demand should continue strong because of the uptrend in production of hogs and poultry in most countries, especially Japan, a major user of U.S. sorghum.

If use increases as expected, carryover stocks will likely decline to around 160 million bushels by October 1, 1979. Of this total, over half will be isolated from the market in the farmer-owned reserve or Government inventory. Through October, about 65 million bushels of 1977 crop sorghum had been placed in the reserve and 15 million bushels had been forfeited to the Government. With over 40 million bushels of 1977 crop sorghum still under loan, another 15 to 25 million bushels could enter the reserve for a total of 95 to 105 million bushels.

Sorghum prices will likely average between \$1.85 and \$2.05 per bushel in the current year, up from \$1.73 in 1977/78. Mid-October farm prices averaged \$1.85 per bushel. Sorghum prices could move moderately higher next summer, depending on progress of the 1979 crop and utilization the next few months. Since free supplies will likely be sharply reduced, prices will be very sensitive to crop developments both in the United States and abroad.

BARLEY

Barley supplies for 1978/79 are up 12 percent over 1977/78 because of a buildup in stocks during 1977 and a 5 percent larger 1978 crop. The barley yield of 48 bushels per acre is up 4 bushels over the average yield of the past 3 years.

Domestic disappearance of barley during June-September was indicated to be up nearly 20 percent over the same period a year earlier, and will likely be up 7 percent for the year. However, the increase in domestic use will be nearly offset by a decline in barley exports to around 40 million bushels, 17 million below 1977. Most of the decline is attributed to Korea, which had a short 1977 crop but a normal 1978 crop. Korea bought about a third of total U.S. barley exports in 1977/78.

With production up in 1978 and little change in use, stocks will again build this year. Carryover stocks are forecast at around 230 million bushels, 60 million above a year earlier and the second largest ever. This level of stocks would represent about 60 percent of utilization for 1978. There are about 35 million bushels of barley in the reserve program to date.

Barley prices will likely average between \$1.80 to \$1.90 per bushel in 1978, slightly above 1977. Barley producers participating in the 1978 feed grain program will be eligible for deficiency payments of about 35 cents per bushel on the normal production from their acreage planted for harvest.

OATS

Oat production in 1978 is down 20 percent from 1977, but a big buildup in stocks during 1977/78 will keep supplies virtually unchanged in 1978/79. Total use is also expected to show little change so that ending stocks next June will be around the year-earlier level of 310 million bushels. Oat prices for this year will likely average around the \$1.14 per bushel of 1977/78. Currently, there are slightly over 38 million bushels of oats in the farmer-owned reserve.

REVIEW OF 1978 FEED GRAIN PROGRAM

The 1978 feed grain program providing for a conditional 10 percent set-aside was announced on November 15, 1977. On February 8, 1978, the 10 percent feed grain set-aside program for 1978 was made final. On March 29, an additional 10 percent feed grain diversion program was announced. This program was designed to encourage greater participation in the feed grain program, particularly for corn, and to further reduce feed grain production.

The sign-up for the set-aside and diversion program was slightly greater than expectations. Nearly 65 percent of the corn acreage and between 75 and 80 percent of the sorghum and barley acreage was enrolled in the program. The higher-than-expected sign-up was due in part to the cold, wet spring in many areas of the country which created uncertainties for producers about being able to plant their crops.

A number of events, however, influenced producers' final decision with respect to participation. First, prices of feed grains and soybeans during planting season were at their highest level in a year, and futures prices encouraged producers to expect they would be at or above planting season levels during the fall. Thus, many producers decided that returns would be greater by planting their entire acreage rather than participating in the set-aside and diversion programs. Second, the weather during the latter part of the planting season turned favorable. Warmer temperatures and very little rainfall allowed producers to plant virtually all of their acreage. Third, livestock prices during May and June were very favorable, which discouraged producers with plans to feed livestock from participating in the program. Cattle prices reached all-time highs, and hog prices were at their highest level in 2 years. All of these factors contributed to the significant dropout in the program.

Final participation figures indicated that about 40 percent of the corn acreage, and 60-65 percent of the sorghum and barley acreage participated in the program. The dropout rate was about 35 percent for corn and 16 to 22 percent for sorghum and barley.

Set-aside and diverted acreage for the feed grain program totaled 8.4 million acres, including 6.1 million acres of corn, 1.5 million acres of sorghum, and 0.8 million acres of barley. If this acreage had been in

production of feed grains in 1978, total feed grain production would likely have been 10 to 14 million tons greater with most of the increase going into stocks.

Details of the 1979 feed grain program must be announced by November 15.

FEED GRAINS AND CORN ¹

Commodity	1976-77	1977-78		1978-79 probable variability ²
		Estimated	Projected	
FEED GRAINS				
Area (million acres):				
Planted.....	128.7	128.1	121.4	
Harvested.....	106.3	107.0	102.3	
Yield per harvested acre (metric tons).....	1.82	1.89	2.05	
	Million metric tons			
Beginning stocks.....	17.2	29.9	40.0	
Production.....	193.4	201.8	209.3	+5 to -5
Imports.....	.4	.3	.3	
Supply, total.....	211.0	232.0	249.6	
Feed.....	112.6	116.7	124.6	+7 to -7
Food, seed, and industrial.....	17.9	18.9	19.4	
Domestic, total.....	130.5	135.6	144.0	+7 to -7
Exports.....	50.6	56.4	54.9	+5 to -5
Use, total.....	181.1	192.0	198.9	+10 to -10
Ending stocks.....	29.9	40.0	50.7	+9 to -9
CORN				
Area (million acres):				
Planted.....	84.4	82.7	78.5	
Harvested.....	71.3	70.0	67.8	
Yield per harvested unit (bushels).....	87.9	91.0	100.7	
	Million bushels			
Beginning stocks.....	399	884	1,064	
Production.....	6,266	6,371	6,824	+225 to -225
Imports.....	3	2	1	
Supply, total.....	6,668	7,257	7,889	
Feed.....	3,587	3,693	3,950	+200 to -200
Food, seed, and industrial.....	513	550	570	
Domestic, total.....	4,100	4,243	4,520	+200 to -200
Exports.....	1,684	1,950	1,900	+150 to -150
Use, total.....	5,784	6,193	6,420	+300 to -300
Ending stocks.....	884	1,064	1,469	+250 to -250
Average farm price ³	\$2.15	\$2.03	\$1.95-\$2.15	

¹ Marketing year beginning Oct. 1 for corn and sorghum; June 1 for barley and oats.

² The "probable variability" reflects the "root mean square error" and/or "standard error of estimate" from trend and judgment. Chances are about 2 out of 3 that the outcome will fall within the indicated ranges.

³ Season average farm price, per bushel.

SORGHUM, BARLEY, AND OATS ¹

Commodity	1976-77	1977-78		1978-79 probable variability ²
		Preliminary	Projected	
SORGHUM				
Yield per harvested unit (bushels).....	48.9	56.2	52.3	-----
Million bushels				
Beginning stocks.....	51	91	191	-----
Production.....	720	791	699	+25 to -25
Imports.....	-----	-----	-----	-----
Supply, total.....	771	882	890	-----
Feed.....	428	470	505	+30 to -30
Food, seed, and industrial.....	6	6	6	-----
Domestic, total.....	434	476	511	+30 to -30
Exports.....	246	215	220	+30 to -30
Use, total.....	680	691	731	+45 to -45
Ending stocks.....	91	191	159	+40 to -40
Average farm price ³	\$2.03	\$1.73	\$1.85-\$2.05	-----
BARLEY				
Yield per harvest unit (bushels).....	44.9	43.8	48.1	-----
Million bushels				
Beginning stocks.....	128	126	171	-----
Production.....	372	416	438	-----
Imports.....	11	9	10	-----
Supply, total.....	511	551	619	-----
Feed.....	161	163	185	+25 to -25
Food, seed and industrial.....	158	160	162	-----
Domestic, total.....	319	323	347	+25 to -25
Exports.....	66	57	40	+10 to -10
Use, total.....	385	380	387	+30 to -30
Ending stocks.....	126	171	232	+20 to -20
Average farm price ³	\$2.25	\$1.80	\$1.80-\$1.90	-----
OATS				
Yield per harvest unit (bushels).....	45.7	55.6	49.9	-----
Million bushels				
Beginning stocks.....	205	165	310	-----
Production.....	546	748	596	-----
Imports.....	1	2	1	-----
Supply, total.....	752	915	907	-----
Feed.....	489	510	510	+30 to -30
Food, seed, and industrial.....	88	84	85	-----
Domestic total.....	577	594	595	+30 to -30
Exports.....	10	11	10	+2 to -2
Use, total.....	587	605	605	+30 to -30
Ending stocks.....	165	310	302	+30 to -30
Average farm price ³	\$1.56	\$1.14	\$1.05-\$1.15	-----

¹ Marketing year beginning Oct. 1 for sorghum, June 1 for barley and oats.² The "probable variability" reflects the "root mean square error" and/or "standard error of estimate" from trend and judgment. Chances are about 2 out of 3 that the outcome will fall within the indicated ranges.³ Season average farm price, per bushel.

COMPARISON OF SIGN UP AND FINAL PARTICIPATION IN THE 1978 FEED GRAIN PROGRAM

Crop	Total planted acreage (million acres)	Acreage signed up (million acres)	Percent signed up	Final participation (million acres)	Percent final participation	Percent dropout
Corn.....	78.5	49.5	63	32.7	42.	34
Sorghum.....	16.6	12.5	75	10.5	63	16
Barley.....	9.9	7.7	78	6.0	61	22
Total.....	105.0	69.7	66	49.2	47	29

PARTICIPATION, SET-ASIDE AND DIVERSION ACREAGE FOR THE 1978 FEED GRAIN PROGRAM

[In millions of acres]

Crop	Participation ¹ (percent)	Set-aside acreage	Diversion acreage	Total set-aside and diverted
Corn.....	42	3.3	2.8	6.1
Sorghum.....	63	1.1	.4	1.5
Barley.....	61	.6	.2	.8
Total.....	47	5.0	3.4	8.4

¹ Expressed as percent of planted acreage in the program.

OUTLOOK FOR FRUIT AND TREE NUTS

(By Jules V. Powell, Agricultural Economist, Economics, Statistics, and Cooperatives Service, USDA)

GENERAL PRICE PROSPECTS

The 1978/79 season will be another banner year for producers of fruits and tree nuts. This season's fruit and tree nut prices are expected to be moderately to substantially above last year's levels. Smaller supplies of most citrus and noncitrus fruits and strong demand in both fresh and processing markets are responsible. Smaller crops of almonds, pecans, and walnuts point to higher prices for those items, also, this holiday season and during the winter months ahead.

Prices received so far this year by growers for fresh and processed fruits have averaged sharply above a year earlier. The index of prices received reached a record high 274 (1967=100) in September, 57 percent above a year ago. The index fell 37 points (13 percent) in October as large supplies of fruit came on the market. However, the index was still 8 percent higher than in October 1977.

Prices received by applegrowers are expected to remain near last year's levels. Demand for apples for both fresh and processing outlets is expected to be good. The 1978 contract prices negotiated for most noncitrus fruit for processing are above last year's levels. Also, the smaller citrus crop will help keep prices relatively high and strengthen processor demand for noncitrus. Consequently, prices received by growers for fresh and processed fruit will average above year-earlier levels through the winter.

Wholesale prices of most processed fruit items have been moderately to substantially above a year ago. The October BLS wholesale price index for canned fruit continued to strengthen, advancing to 205.4 (1967=100), up from 201.4 in September, 3 percent higher than last year. With the higher contract prices of raw product, and higher processing costs, wholesale prices of canned fruit are expected to continue to rise. In response to good demand and tight supply of frozen concentrated orange juice (FCOJ), the wholesale price index for frozen fruits and juices has been well above last year. Prices are likely to remain higher as the citrus packers in Florida have announced a price hike for FCOJ.

Although wholesale prices for dried and dehydrated fruits had been considerably below year-earlier levels, they rose sharply in October because of the damage to raisin grapes in California resulting from the early September rains.

Retail prices for most fresh fruit have averaged sharply above a year ago. The Bureau of Labor Statistics (BLS) September retail price index for fresh fruit stood at 243.2 (1967=100), down slightly from a high of 252.8 in August, but well above the 180.4 of a year earlier. As supplies of fresh fruit increase seasonally, retail prices are expected

to continue to decline this fall. However, continued good demand combined with higher costs of marketing will keep the retail fresh fruit price index moderately to substantially higher this winter than a year earlier.

TABLE 1.—INDEX OF QUARTERLY PRICES RECEIVED BY GROWERS FOR FRESH AND PROCESSED FRUIT

Year	(1967=100)			
	1st	2d	3d	4th
1974	133	140	148	142
1975	129	152	140	130
1976	126	126	130	135
1977	122	147	164	135
1978	195	224	258	

TABLE 2.—QUARTERLY RETAIL PRICE INDEXES FOR FRESH FRUIT

Year	(1967=100)			
	1st	2d	3d	4th
1974	138	153	164	145
1975	150	171	177	149
1976	146	161	170	167
1977	172	190	193	186
1978 ¹	196	216		
1978 ²	194	222	247	

¹ From 1973 to June 1978, these indexes were entitled "Urban Wage Earners and Clerical Workers," BLS discontinued these indexes as of June 1978.

² Starting with January 1978 a new index entitled "All Urban Consumers," replaces previous index.

FRESH CITRUS FRUIT

The first forecast of U.S. citrus production (excluding grapefruit in California's "other" areas) for the 1978/79 season is estimated at 13.8 million tons, down 3 percent from the 1977/78 utilized crop and 10 percent below the 1976/77 record. All crops, except tangerines, are expected to be smaller than they were during the past season. Tangerine production will increase in Florida and California.

Oranges

The first forecast for the 1978/79 season points to an orange crop of 215 million boxes, 2 percent below last season's crop and 12 percent below the 1976/77 output. In Florida, the round orange forecast calls for 167 million boxes, 800,000 less than last year. If current prospects are realized, Florida will produce four-fifths of the U.S. orange crop. California expects a crop of 38 million boxes—the smallest crop in recent years—the result of a smaller Valencia crop. Texas expects a slightly larger crop than last year, but this gain will be offset by a smaller crop in Arizona.

The smaller crop prospects for 1978/79, combined with small carry-over stocks of most processed items, will keep orange prices at high levels throughout this season. Current market prospects for oranges through the winter point to grower prices moderately to substantially higher than last year's high levels and will be reflected at the retail level in the months ahead.

Foreign demand for fresh oranges declined during the 1977/78 season. Through August, U.S. exports of fresh oranges totaled 308,271

metric tons, down 14 percent from the previous year. Canada, our largest customer, accounting for nearly half of our exports, reduced its purchases by 9 percent. This decline, coupled with smaller exports to nearly all of the European countries, overpowered the 104-percent increase in exports to Japan. Reflecting some U.S. progress in the "orange war," Japan agreed to increase imports of fresh citrus approximately threefold.

With the current low valuation of the U.S. dollar against other major world currencies, U.S. citrus will be a bargain abroad, and prospects for exports of oranges would normally be bright. However, the continued tight domestic supply situation, coupled with a large crop and aggressive marketing by Brazil, will keep exports at moderate levels.

Grapefruit

Prospects for U.S. grapefruit production, during the 1978/79 season, point to a crop of 68.4 million boxes (for California, includes desert fruit only) down 3 percent from last season and 4 percent below the 1976/77 total. Last year, California's "other" areas had a crop of 3.2 million boxes, so the total may approximate 72 million boxes.

Florida's total grapefruit forecast of 51 million boxes is down 1 percent from last year. The Texas grapefruit crop is estimated at 11 million boxes, down 8 percent from the previous season's total. Arizona is expected to harvest 2.6 million boxes, compared with 2.9 million last year. Prospective production in California's desert areas, at 3.8 million boxes, will be down 12 percent from the 1977/78 level. California grapefruit production in "other" areas will be forecast on December 8.

Grapefruit prices for the 1977/78 season were generally higher than a year earlier. Because the Florida grapefruit crop is maturing later than normal this year, shipments from Florida were negligible through early October and opening prices were high. In view of the smaller supplies and good demand, prices are expected to average near last year's levels through the winter.

Export demand for fresh grapefruit declined moderately during the 1977/78 season. Through August, the United States had exported 265,162 metric tons of fresh grapefruit, down 5 percent from the year-earlier figure. The overall decline was caused by an 18-percent drop in grapefruit exports to Japan. Exports to Canada and Europe were running ahead of the previous year's totals. Although the grapefruit crop is down from last year, it is still a large crop. With the dollar currently weak against the Japanese yen, prospects are for grapefruit exports to that country to rebound and for overall exports to be at high levels throughout the 1978/79 season.

Lemons

The California-Arizona lemon crop for 1978/79 is expected to total 26 million boxes (896 thousand metric tons), slightly less than last season and the same as the 1976/77 crop. The crop for California, which produced 20.4 million boxes last season, is forecast at 19 million boxes and Arizona's crop is expected to total 7 million boxes, up from 5.7 million a year earlier. In the desert areas of Arizona and California grades are good, conditions are excellent, and the fruit is sizing well.

The 1977/78 season average price received by growers for lemons in all areas for all uses was \$1.94 per box, up moderately from a year

earlier. Equivalent on-tree returns for fresh use, however, spurted to \$5.72 per box, nearly a third higher than the season before. Shipments of fresh lemons through October 21 were substantially smaller than a year earlier and f.o.b. prices, at \$8.01 per carton, were 14 percent higher than at the same date a year earlier. Prices have declined, but will probably average slightly higher this year than last.

PROCESSED CITRUS

Nearly three-fourths of the 1977/78 U.S. citrus crop was processed. The total of 19.5 million tons was 8 percent below the record set a year earlier. Sales of fresh citrus totaled 3.7 million tons, 3 percent less than in the 1976/77 season and 10 percent less than 2 years earlier. Approximately 82 percent of the oranges, 60 percent of the grapefruit, and 56 percent of the lemons were processed.

The 1977-78 net pack of Florida frozen concentrated orange juice (FCOJ) was 161.2 million gallons, up slightly from 158 million gallons a year earlier. The smaller crop and a below-average juice yield were responsible. Processors recovered 1.23 gallons of 45° Brix FCOJ per box from the 1977-78 crop. While the juice yield was well above the 1.07 gallons from the freeze-damaged crop a year earlier, it was still below the 1.29-1.31 gallons the industry had become accustomed to. Juice yield is currently estimated at 1.29 gallons of 45° Brix concentrate per box for the 1978-79 crop.

Because of higher prices, movement of FCOJ has been behind last season's pace. However, the weekly movement rate increased in September, due at least partially to anticipation of the new crop. However, because of the sharply smaller carry-in, stocks on October 21, at 44.7 million gallons, were slightly smaller than a year ago. Prices for FCOJ f.o.b. Florida packing plants had been steady at \$3.30-\$3.35 per dozen 6-ounce cans (unadvertised brands) throughout the season. Immediately after the first crop forecast of the 1978-79 season, however, a major packer raised the price to \$3.86 per dozen. Another went up to \$3.55. These prices could dampen product movement. Depending on the extent to which this rate of movement can be slowed, carry-out at the end of this season should be near or slightly below the 25-million-gallon level of last year.

FRESH NONCITRUS FRUIT

The 1978 noncitrus crop is forecast at 11.3 million tons, slightly below both 1977 and 1976. Because of good demand in both fresh and processing outlets, and smaller supplies, shipping point prices for most fresh noncitrus fruit were generally moderately to substantially above a year ago. They have declined seasonally, but are expected to remain relatively high during the 1978-79 season.

The final forecast for the 1978 U.S. apple crop was placed at 7.38 billion pounds (3.35 million metric tons). This was 11 percent above last season's total, and 14 percent higher than the freeze-damaged 1976 crop.

Opening f.o.b. prices for fresh apples at major shipping points were generally substantially above year-earlier levels. Prices have fallen with the increase in shipments. However, good demand, combined with a smaller prospective citrus crop is likely to keep apple prices near last year's high levels.

Prospective demand for fresh apples in Europe is not favorable. The 1978 apple crops in most of the European countries are expected to be substantially above the small 1977 production. France expects an apple crop 37 percent larger than in 1977. The apple crop in Germany, a key importing country on the continent, is expected to be 31 percent larger. Prospects for exports to Canada, our largest customer, are not encouraging because Canadian apple production is expected to be up 9 percent from 1977. In addition, U.S. apples will also be more expensive in Canada because of the decline in the value of the Canadian dollar. However, exports of apples to other parts of the world, particularly the Far East and Middle East are expected to increase.

The final forecast of U.S. grape production as of October 1, at 4.32 million tons (3.92 million metric tons), was 6 percent below the record expectations of a month ago, but slightly above last season's output. Larger crops were forecast for all States except California and Arkansas. Prospects in California now point to a crop of 3.8 million tons compared with the 4.1 million expected a month ago. California's 5 percent smaller output now accounts for 88 percent of the crop, compared with 93 percent a year ago. Damaging rains early in September reduced the prospective production for all varieties.

Through mid-October, shipments of fresh table grapes totaled 39.4 million pounds compared with 50.7 million pounds during the corresponding period a year ago. Shipping point prices have declined seasonally but they are still above year-earlier levels. By mid-October, Ribiers were quoted at \$8.13 per 23-pound lug in Kern County, Calif., slightly above a year ago. Emperors were quoted at \$7 per 23-pound lug, an increase of 12 percent over last year. Prices will remain higher throughout the season.

In early October, the Raisin Bargaining Association announced that the packers have accepted a field price of natural Thompson Seedless and Zante currants at \$1,600 per sweat box ton. One provision of the agreement called for packers to waive the grower rental charge for bins and boxes used for the 1978-79 crop. This price offer and rental charge provision were accepted by a majority of packers. This season's price for natural Thompson Seedless is \$760 per ton above 1977, reflecting the rain damage to the crop.

Through October 18, only 8,172 tons of natural Thompson Seedless raisins had been received by handlers and 17,102 tons of all types. This compares with 155,324 tons for the corresponding period a year earlier. The 1978 raisin output will be sharply below the 248,300 tons (dried basis) in 1977.

The final forecast of the 1978 U.S. pear crop placed production at 699,000 tons (634,000 metric tons), 11 percent below 1977. Output of Bartlett pears in Washington, Oregon, and California is forecast at 452,000 tons, off 17 percent from the 1977 total. Production of pears other than Bartletts, most of which are fall and winter varieties in the Pacific coast, is forecast at 203,000 tons, 4 percent above the 1977 crop. Due to poor pollinization weather last spring, pear production in other than Pacific coast States is forecast at 43,700 tons, down 9 percent from a year earlier.

Fresh market shipments of pears from the Pacific coast area so far this season through mid-October have been near last year's levels, even with a smaller crop. California's movement was down moderately,

but larger shipments from Oregon and Washington were offsetting. However, f.o.b. fresh Bartlett prices on the west coast have been sharply above year-earlier levels. In mid-October, the f.o.b. quotation for Bartlett pears at Sacramento, Calif., was \$13 per box U.S. No. 1 90-150's compared with \$8.88 a year ago. Prices for Washington Bartlett pears at Yakima-Wenatchee averaged \$10.63 U.S. No. 1 90-135's compared with \$8.50 a year ago. Opening f.o.b. prices for winter pears were also substantially higher than last year. Even though production of winter pears in the Northwest is moderately larger, late-season pear prices are not likely to weaken significantly.

Smaller carryover of canned pears and available supplies of Bartlett pears have resulted in higher prices for processing use. Growers and canners in California agreed to a field price of \$182.50 per ton for No. 1 grade Bartletts, an increase of 52 percent from 1977. The Washington-Oregon Canning Pear Association reported the cannery price for No. 1 Bartletts, 2 inches and larger at \$185 per ton compared with \$115 in 1977. These high prices will be reflected at the retail level.

PROCESSED NONCITRUS

With a slightly smaller noncitrus crop, the 1978-79 pack of most noncitrus fruit is likely to be less than that of a year ago. Thus, combined with the smaller carryover, total supplies of canned noncitrus products will be below year-earlier levels. Supplies of dried fruit, particularly raisins, are expected to be tight because of the damage from unseasonal rain in early September in California and subsequent poor drying weather. Frozen fruit and berry supplies are also expected to be smaller as deliveries of berries to processors have been substantially less than last year. The smaller supply plus higher cost of raw products and processing will further strengthen prices of processed noncitrus items at all levels.

The 1978 U.S. pack of frozen deciduous fruit and berries is expected to be smaller than the 636.6 million pounds packed in 1977. So far this season, receipts of strawberries delivered to California freezers totaled 116.6 million pounds through mid-October compared with 157.7 million pounds a year ago. Imports of frozen strawberries during the first 8 months of 1978 were also slightly less than the corresponding period a year earlier. In contrast, freezers' receipts of blackberries from Oregon have been substantially above year-earlier levels while those of blueberries from Michigan and Oregon are also expected to be substantially larger.

Reflecting a sharply smaller crop in Michigan, the freezers' pack of red tart cherries was substantially less than last year. Generally sharply larger packs were reported for the East, particularly New York and Pennsylvania, but sharply smaller packs in the Midwest were offsetting.

Cold storage stocks down

With the smaller cold storage holdings for most principal fruit, total cold storage stocks of frozen fruit and berries amounted to 560 million pounds on October 1, 11 percent less than the corresponding period a year earlier. Stocks of strawberries at 157 million pounds and red tart cherries at 78 million pounds were down 24 and 17 percent, respectively, from a year ago, but those of peaches were 17 percent larger.

Because of a sharply smaller frozen stock, wholesale prices of frozen strawberries reached a record high \$5.11 per dozen 11-ounce packages in September, up 4 percent from a year ago. With the smaller supplies of most processed noncitrus fruit in prospect, prices of frozen strawberries will remain higher during the 1978/79 season.

The 1978/79 pack of most canned noncitrus fruit will be moderately to substantially below last year's. Complete pack data for canned noncitrus items available so far this season indicate that the pack of canned Clingstone peaches amounted to 19.6 million cases (24 No. 2's) compared with 27.6 million cases last year. Even with a moderately larger carryover, total supplies of canned Clingstone peaches for this season are considerably smaller than the relatively high levels of a year ago. Because of smaller crops of Clingstone peaches and Bartlett pears, the pack of canned fruit cocktail totaled 11.7 million cases (24 No. 2's), a tenth below the year-earlier level. With the smaller carry-in at the beginning of the 1978/79 season, the total supply of canned fruit cocktail is smaller than 1977/78.

The Bartlett pear pack is one-third smaller than a year ago. With carryover of only 0.9 million cases, the total supply of canned pears, at 3.2 million cases (24-2½'s), is one-third smaller than last year and only slightly more than half as large as the year before. Recently, most California private label packers announced price increases for canned pears.

Reflecting the larger crop and smaller carryover, the total pack of canned apple products is expected to be larger this season. Apple processors will benefit from smaller supplies of other processed noncitrus items. Even with the larger supplies in prospect, prices of canned apple items will remain firm during the 1978/79 season.

Prices are moderately to sharply higher for all canned noncitrus. In view of higher costs of raw products, and higher costs of processing and marketing, prices of canned fruits at all levels will remain higher this year.

Exports of canned noncitrus fruit so far this season have shown a mixed pattern, but it is too early to establish a trend. Exports of canned peaches during the first 3 months of 1978/79 have remained strong, up 82 percent from the comparable period a year ago. A strong increase in canned cherry exports, except Maraschino cherries, from last year's low level was also reported. Exports of canned fruit cocktail were up 20 percent, and Maraschino cherries were up 3 percent, while exports of canned pears were down 7 percent from last year's level.

U.S. production of dried fruit for the 1978/79 season is expected to be considerably less than last season. Damaging rains early in September followed by cool, damp weather reduced production of raisin variety grapes to 1.75 million tons, off 5 percent from the September forecast. It includes all grapes for harvest as well as those laid for raisin production. The portion of the crop to be used for raisins is in poor condition and an abnormal amount will be diverted to other processing outlets. In mid-October, official estimates of the final outturn are not available. The production of dried prunes and other major dried fruit items in California was also adversely affected by the wet weather, but to a lesser extent than raisins.

TREE NUTS

The 1978/79 crop of the four major edible tree nuts—almonds, filberts, pecans, and walnuts—is estimated at 447,950 tons (in shell basis), down more than a fifth from last season. Sharply smaller crops of almonds and walnuts, and a substantially smaller crop of pecans, are responsible.

Almond production in California is forecast at 170,000 tons, down nearly a third from last year's final output. Reasons for such a short crop include: (1) poor pollinating weather, (2) an unusually warm winter that did not provide adequate dormancy and (3) loss of tree vigor due to 2 years of record crops and subnormal rainfall. The current healthy, vigorous State of California almond trees, however, portends a return to large crop again in 1979 and a continued strong industry growth pattern.

In response to excellent demand at home and abroad, the average price received by almond growers for the 1977 crop was \$1,030 per ton, up sharply from a year earlier. With a sharply smaller crop in prospect, grower prices will average much higher this year. Early spot prices have been more than 50 percent higher than last year.

The 1978 filbert crop is forecast at 11,800 tons, the same as last year, but 64 percent above the small 1976 crop. Oregon, nut sizes are larger than last year, and in Washington there are more single and double nuts and fewer triple nuts than a year ago. As usual, Oregon will produce about 97 percent of the U.S. filbert crop.

U.S. producers will benefit from the higher world filbert prices. Last year U.S. prices to growers averaged \$687 per ton, up from \$640 a year earlier. This year, boosted by higher world prices for filberts and shorter crops and higher prices for competing nuts, prices should average well above last year. In mid-October, growers were selling good quality new crop filberts at 42 cents per pound.

The October 1 forecast of the U.S. pecan crop places production at 212 million pounds, 10 percent less than last year but more than double the short 1976 crop. Dry weather in September throughout most of the South reduced the crop from earlier expectations, but in Georgia, the leading producer of improved varieties, the crop is heavy. This year, improved varieties are expected to account for 65 percent of the total crop. Improved varieties were only 58 percent last year.

Carryover stocks of pecans on September 30 were more than double those of a year ago. However, the pecan industry is still recovering from the disastrous 1976 season. Prices were at high levels last year, as distributors attempted to fill the marketing pipelines. Prices will continue at high levels this year reflecting the smaller pecan crop, smaller crops of almonds and walnuts, and high world prices for nearly all of the competing tree nuts.

Production of walnuts in California is forecast at 160,000 tons, 17 percent below last season's crop and 13 percent below the 1976 crop. This decline also reflects the effects of the prolonged California drought which persisted through last summer and the mild winter last year. Nut sizes are comparable to last year, but the set is below normal.

PER CAPITA FRUIT CONSUMPTION

Total civilian per capita fruit consumption decline in 1977 to 216 pounds per person (fresh weight equivalent), down from a post-World War II high of 219.8 pounds in 1976. Smaller citrus supplies, resulting from the January 1977 freeze were responsible for most of the decline. Consumption of most other fruits remained near year-earlier levels.

Per capita consumption of fresh fruit decreased slightly to 84.1 pounds—down from 86.6 in 1976—as the increase in noncitrus consumption failed to offset the substantial decline in citrus consumption. Per capita consumption of fresh citrus declined 12 percent to 26 pounds, with all citrus except lemons, limes, and tangelos sharing in the decline. Per capita consumption of processed fruit declined slightly from 132.2 to 131.9 pounds per person during 1977, due primarily to the decrease in canned citrus juice and dried fruit. Per capita consumption of processed noncitrus fruit increased slightly to 46.2 pounds per person with the largest gains in canned fruits (other than apples) and juices.

Preliminary estimates indicate that per capita consumption of fresh fruit will edge up to 84.3 pounds per person in 1978 due mostly to the larger apple crop in 1978. Consumption of fresh apples is expected to increase to 18.7 pounds per person in 1978 while fresh citrus consumption will decline about one-half pound per person to 26 pounds.

Per capita consumption of canned fruits will decline slightly for the calendar year 1978, down to about 19 pounds per person. Consumption of other processed fruit items will also be down slightly from year-earlier levels.

While forecasting fruit supplies a year ahead is, at best, risky, production trends and patterns indicate larger crops of summer fruits in California in 1979. A larger citrus crop could be expected as the Florida citrus groves continue to recover from the January 1977 freeze damage. The potentially larger apple crop is expected particularly from the main producing States. If these materialize, per capita fruit consumption could rebound to the 220-pound level in 1979.

OUTLOOK FOR VEGETABLES AND POTATOES

(By Charles W. Porter, Agricultural Economist, Economics, Statistics, and Cooperatives Service, USDA)

FRESH VEGETABLES

Increased supplies—higher prices!

Fresh market vegetable prices to growers have averaged sharply higher much of the year ever since spring because of the disrupted supply patterns of lettuce, celery, and a few other California vegetables. Curiously enough, total supplies were not greatly different from a year earlier, but crop values were sharply higher. In fact, 10 percent more spring lettuce was worth three times as much as a year earlier. This reflects in the part at least a more rigid demand pattern emerging from fast food operators' dependence on lettuce from single production areas to supply an increasing number of "salad bars." The California 1978 spring crop was worth \$260 million against only a more typical \$80 million for the spring of 1977. For the entire year, crop values for all fresh vegetables combined will far exceed the previous record. For the first half of 1978, the f.o.b. value of fresh vegetables came to \$1.2 billion, sharply higher than the \$879 million of last year.

Total supplies for the first half of 1978 were actually 3 percent larger than a year earlier. It was a question of larger winter harvests and larger imports offsetting slightly smaller spring tonnage.

Supplies the last half of the year may be close to 4 percent more than a year earlier if yields equal the historical average, and for the entire year domestic tonnage and imports would still add up to 3 to 4 percent more than a year earlier.

After the disrupted supply pattern of the spring, supplies of fresh vegetables increased seasonally by late July. At that time, grower prices skidded sharply, and by September were very close to a year earlier. However, the July price kept the summer (third) quarter substantially higher than a year earlier. For the balance of the year, a stable price level, the same to slightly higher than a year earlier, is expected.

QUARTERLY RETAIL PRICES FOR FRESH VEGETABLES¹

[1967=100]

Year	1st	2d	3d	4th	Annual
1970.....	130	131	111	111	121
1971.....	119	137	120	129	126
1972.....	137	134	128	133	133
1973.....	151	167	153	138	152
1974.....	150	160	152	151	153
1975.....	168	169	165	160	166
1976.....	170	168	165	179	170
1977.....	221	216	178	184	200
1978 ²	212	247	209	-----	-----

¹ Excludes potatoes.

² Consumer Price Index all urban.

Note: USDA estimate derived from Consumer Price Index.

QUARTERLY FARM PRICES FOR FRESH VEGETABLES¹

[1967=100]

Year	1st	2d	3d	4th	Annual
1970.....	125	113	103	97	110
1971.....	125	129	106	143	126
1972.....	134	126	123	133	129
1973.....	160	143	145	126	156
1974.....	143	164	143	158	152
1975.....	168	183	165	174	173
1976.....	178	154	166	183	170
1977.....	255	183	166	185	197
1978.....	206	265	190	-----	-----

¹ Excludes potatoes.

Retail prices for fresh vegetables have followed the pattern of grower prices, though in somewhat less volatile fashion. Demand for fresh vegetables has been exceptionally strong this year, and is likely to remain that way as long as the general level of economic activity holds high.

Fall supplies probably heavier

Fall fresh market vegetable acreage is 4 percent more than a year earlier. A 4-percent greater production is also expected if yields follow recent historical average. These data include 14 vegetables but omit melons. There will be more acres of snap beans, cabbage, carrots, cauliflower, cucumbers, green peppers, spinach, and tomatoes. Fewer acres of broccoli, sweet corn, escarole-endive, and lettuce have been planted.

PROCESSED VEGETABLES

Raw tonnage of processing vegetables less this year

Raw tonnage of seven major processing vegetable crops is expected to fall to 10.6 million tons, 8 percent below a year earlier. Growers and processors planned a substantial tomato acreage cut and changes for other crops were relatively small. It is possible that final data will show this figure to be off slightly more. Wet weather followed by frost in Wisconsin cut short the last of the snap bean and corn harvests in the upper Midwest.

Larger tomato pack carried over

This total canned vegetable carryover into 1978-79 was larger than a year earlier, only because tomato products except juice were in heavy supply. When these items are excluded from the mix of canned vegetables, moderately less old pack remained on hand at the end of the old season. At this time, it appears that total supplies of all major canned vegetables—tomato products, corn, snap beans, and peas, will be moderately lighter than a year earlier.

The frozen vegetable carryover on August 1, 1978, for seven important freezing vegetables was 497 million pounds, 29 percent more than the small supply remaining a year earlier. Even if new packs are slightly reduced, the supply available for 1978-79 markets is likely to be about the same as a year earlier.

Therefore, total supplies of canned and frozen vegetables are expected to be adequate, but tighter than a year earlier. Adding together prospective packs for which data will eventually become available,

total supplies will be slightly to moderately less, though large enough to cover expected disappearance.

Stocks of frozen vegetables on October 1 were 11 percent larger than a year earlier. This includes a good portion of the 1978 pack and takes into account a carryover this past summer that also was larger than in other recent seasons. Limited additions to the 1978 main season pack may be made, and as usual there will be winter freezing of spinach in California, followed somewhat later by broccoli, carrots, and cauliflower.

Prices for processed vegetables have been firm to stronger since early summer. The ESCS index of canned vegetable prices rose 3 percent between July and August, anticipating somewhat tighter supplies of peas, canned tomatoes, tomato paste, sauce, and catsup. The September figure (1967=100) of 181 rose by 5 points in October. Some further rise may be expected.

Prices for frozen vegetables also have been firm, and in some cases slightly higher in recent weeks. With a relatively tight supply position for several important canned and frozen vegetables, it now is beginning to look as though more tonnage of the most important crops will be needed in 1979.

Input costs for processors will again be higher in 1979. With the expected need for additional raw product, increased prices to growers are likely. Packaging costs are expected to bump into any guideline restrictions, and trucking costs will reflect the result of union negotiations before the year is over.

Some leading items

The 25 million case pack of canned peas was the smallest in years, and the 1978-79 supply is less than movement the previous 2 marketing years. Buyers will be shifting to corn and snap beans.

Although the estimated tonnage of snap beans for canning and freezing is 9 percent larger this year, total supplies are expected to be only adequate for trade needs. The carryover of canned beans was again very light, 5 million earlier, will not set any records. October 1 stocks of frozen snap beans were 179 million pounds, a near average figure for that particular month.

Contracted tonnage of sweet corn for both forms of processing is 2.4 million tons, 4 percent more than a year earlier. This year, the midwest canning States may turn out to pack less while the predominately freezing States of the Pacific Northwest expect to handle a larger tonnage this year. Disappearance of canned corn during 1977-78 was record large, as heavy stocks and attractive prices stimulated movement. The resulting carryover of 7.6 million cases 24/303's was lower than either of the two previous seasons. Although the 1978 pack probably will be moderately smaller, total supplies probably would be large enough to sustain a movement equal to most other recent seasons except 1977-78. The combined carryover of cut and on-cob frozen corn has differed little from year earlier. However, larger packs will boost supplies for 1978-79. October stocks, which include much of the new pack, were 7 percent larger than a year earlier.

Prices of canned corn have advanced recently, reflecting the reduction of heavy supplies of a year earlier. Further advances are expected. On the other hand, frozen corn prices are steadier. Prices are slightly higher than a year earlier for both on-cob and cut packs.

Contracted tomato tonnage this year is 14 percent smaller, largely because the crop in California is 16 percent less than 1977. There is also some reduction in both the mid-Atlantic States and in the Midwest. Reductions in New Jersey, Pennsylvania, and Ohio offset gains in Indiana, Virginia, and Maryland. Deliveries to California canners as of mid-October totaled 5.5 million tons, meaning that the total used would come close to earlier made plans for this season. Substantial reduction of raw tonnage was required to bring supplies of tomato products more closely in line with expected requirements for 1978-79. At this time, the mix of the various tomato products is not known, but in general, the excessive supply situation of 1977-78 will be relieved.

As of late September, some canners have posted higher list prices for catsup, paste, and sauce, but little trading has taken place thus far. Buyers seem to be waiting out the market. The contract tonnage of cabbage to be used for sauerkraut has been planned to exceed last year by 6 percent, but trade observers noted that heavy rains in Wisconsin cut the supply of raw cabbage, so that list prices for new pack now are sharply higher. United States October 1 stocks, which reflect some new pack, were the lowest since 1973. Frozen broccoli stocks on September 1 showed a balanced supply of 50 million pounds just as the fall pack season was getting underway in California. Prices for various styles and packs have not changed from a year earlier. Sharply larger stocks of frozen cauliflower are on hand, and some "deals" are reported in an effort to stimulate movement. Frozen spinach is in relatively light supply with prices advancing in the early fall weeks to levels sharply higher than a year earlier. October stocks were the smallest since 1970. Larger supplies of frozen carrots do not seem to be depressing prices for this increasingly popular frozen item.

POTATOES

Record fall tonnage

The U.S. fall potato crop is again record large, 1.5 percent higher than the previous record of 1976. The acreage harvested was 1 percent larger than 1977, and the average yield across the country was 272 hundredweight per acre. This high yield maintains the historical trend. Improved yields not only are a result of improved management and technology applied to production, but also a reflection of the continuing shift of the industry to parts of the West where the highest average yields are attained.

This year, production in the Western States is 197 million hundredweight, 4 percent more than last season. There are larger crops in all the important States except Washington where acreage was reduced. A high quality crop was dug in most of Idaho, with growers reporting a large proportion of size A's.

POTATOES, WHITE: ACREAGE, YIELD PER ACRE, AND PRODUCTION, ANNUAL 1976, 1977, AND INDICATED 1978

Season group	Acreage (1,000 acres)			Yield per acre (hundredweight)			Production (1,000 hundredweight)		
	Harvested		For harvest 1978	1976	1977	Indicated 1978	1976	1977	Indicated 1978
	1976	1977							
Winter-----	14.4	13.4	12.9	207	199	203	2,984	2,660	2,621
Spring-----	98.4	91.4	90.7	251	250	199	24,722	22,870	18,028
Summer-----	118.7	115.2	112.2	190	191	187	22,541	21,982	21,013
Fall:									
8 Eastern-----	199.9	197.9	202.2	254	252	233	50,734	49,836	47,072
8 Central-----	301.8	322.3	313.3	191	210	216	57,718	67,772	67,724
9 Western-----	641.3	618.5	630.9	310	306	313	198,975	189,456	197,222
Total-----	1,143.0	1,138.7	1,146.4	269	270	272	307,427	307,064	312,018
United States-----	1,374.5	1,358.7	1,362.2	260	261	260	357,674	354,576	353,680

In the Midwest, the crop is the same size as last year. A rather surprising development was the sharply higher than average yields in the Red River Valley. Production there exceeded last year, despite the reduced acreage. Storage space there is short, as growers have sought even temporary facilities to hold the crop. Elsewhere in the region, Michigan, Wisconsin, and Ohio have less to sell this season.

In the East, the reduced yields in Maine pushed production 10 percent below a year earlier. In that State, rain was short during August, reducing yields to 215 hundredweight per acre, the smallest since 1973. In New York there is more upstate, but less than 1977 on Long Island. Pennsylvania's relatively early harvest was slightly smaller this year.

Heavy supplies to keep pressure on prices

The price outlook for this record crop is hardly a favorable one for the growers for the first part of the marketing season, at least. For the fourth quarter of 1977, the U.S. average grower prices for all methods of sales combined was \$3.08 per hundredweight. A 2-percent change in supply would suggest prices closer to \$3 this last quarter of 1978. However, processing contract prices which account for a significant portion of the crop in the Pacific Northwest are roughly a dime per hundredweight higher than last season. This will partly offset the force of heavy supply. The high rate of inflation of 1978 will also be a factor in keeping the average price higher.

Nationwide, the 1978 crop is generally one of exceptionally good quality which means it can store well. Processors can expect very good recovery rates, thus making more out of a given supply of raw product. In addition, it is difficult to ascertain how much a good quality crop will stimulate fresh market sales. These are some of the basic conflicting elements that bear upon price and demand situation this fall.

Fairly good processor demand

Processor demand this fall may be expected to continue reasonably strong, about the same as for the season now ending. Stocks of frozen potato products on October 1 were 651 million pounds, 6 percent more than on the comparable date a year earlier. This larger figure may be regarded as having a minimal effect on demand for raw product this fall, because use of frozen products continues its long-term expansion. On the other hand, the demand for flakes and granules may be expected to hold fairly steady, perhaps improving moderately from the 1977 pattern.

Chip usage in 1978/79 can be expected to reflect the same turn taken by the entire economy. However, the potential supply of round white varieties for chipping may be moderately less than a year earlier. The Midwest has grown more Russets this year, and total production in the East, where round varieties predominate, is less. If purchasing power holds up, chip use would be well maintained or increase slightly.

Total processing demand is now expected to exert a stabilizing influence on fall potato prices with the prospect of more potatoes going for the various processing uses in 1978/79.

SWEET POTATOES

The U.S. sweet potato crop at 13.8 million hundredweight is the largest since the 1960's. Both acreage and yield are up this year, and the crop is 11 percent larger than 1977. Generally good growing and harvesting conditions in many States were responsible for the 116-hundredweight-per-acre yield this season. Texas is one area where the crop came up short. Dry weather during the summer was the cause. In North Carolina, half the harvest was complete by the end of September, and nearly two-thirds of the Louisiana crop was out of the ground by the same date. These two States account for 56 percent of the U.S. crop.

With supplies of canned sweet potatoes virtually exhausted by the beginning of the new pack season, canners were actively bidding for raw stock in Louisiana and North Carolina early in September. In the latter State, canners were paying as much as \$3 per 50 pounds delivered. Since that time, prices have moved downward to \$1.75 after increased supplies became available.

MUSHROOMS

The U.S. mushroom production set another record in 1977-78—moving up 15 percent over a year earlier to 399 million pounds. Pennsylvania, the leading State, accounted for 220 million pounds or 55 percent of the U.S. total. The average yield of 2.95 pounds per square foot is the highest average yield attained in the years since annual data have been published.

Fresh market sales of mushrooms, at 191 million pounds, rose 26 percent over a year earlier, and fresh use absorbed 48 percent of U.S. output. The average price for the crop moving through these market channels reached 90 cents per pound, the highest price of record.

Domestic processed mushroom use also gained during 1977-78 though progress was less spectacular. Processor use gained 6 percent, accounting for 208 million pounds canned, or canned as soup. This figure would also include small quantities dried and frozen as well. The grower's average price received for processing mushrooms was 65.2 cents per pound. This price compares with 66.9 cents a year earlier. This is the first weakness in mushroom prices to show up in recent years. It reflected some erosion of the competitive position of domestic canners.

The International Trade Commission, in their domestic canning pack monitoring program, noted that 94.6 million pounds were canned this past season. This decline from 101.5 million pounds a year earlier suggests that other processing uses, soups, dried and frozen products,

probably accounted for more of the domestic processing activity during 1977-78. The same report noted that total canned consumption moved to 191 million pounds, nearly 1 pound per person product weight basis. It required 92 million pounds of canned imports in addition to the domestic sales to add up to this figure.

Looking ahead to 1978-79, mushroom growers in the United States expect to increase production area by 11 percent, capitalizing on the strong fresh market demand. If growers carry out these plans, first fillings would be up 3 percent, second by 4 percent, and with additional fillings up a fourth.

DRY EDIBLE BEANS

The dry bean crop prospect declined during September. This year the drop was not severe, and the current estimate calls for a relatively large 18.6 million hundredweight. The current crop is still 14 percent more than last year. In general, there are larger crops of both white and colored classes of beans, but total lima bean output from California is slightly less. Prospective yields for all major California varieties declined during September, with large limas showing the largest cut. In Michigan, a rainy spell late in September reduced yield prospects there, though the crop did experience very favorable harvest conditions earlier in that month. Late season rains affected Idaho harvesting activity, and modest yield reduction showed up in Washington and Wyoming.

The average price received by growers for beans moved downward between February and September. In view of the smaller October crop estimate, prices partially recovered, moving from \$14.60 per hundredweight in September to \$16.20 in October.

Export prospects for 1978-79 are not clear at this time, as no unusual shortages have been noted thus far. With Ontario having a more normal-sized crop to export to the United Kingdom this year, total U.S. pear bean exports may fall below a year earlier. However, at the moment, the Ontario Bean Marketing Board has not been making new crop sales. Thus, September and October Michigan export sales have been well above last year. A large crop of alubia beans, a variety comparable to the U.S. great northern, grown in Argentina, is competing with our potential sales to Europe. The size of the Mexican crop is not known at this time, so present prospects suggest that their foreign trade will be of routine character. Mexico normally imports and exports moderate quantities, even though that country is largely self-sufficient.

OUTLOOK FOR LIVESTOCK AND MEAT

(By James E. Nix, Agricultural Economist, Economics, Statistics, and Cooperatives Service)

Some dramatic events have occurred in the livestock and meat industries this year. Some of these were anticipated a year ago but many were not. Beef production has declined about as expected, but pork production has not increased nearly as much as forecasted a year ago. Earlier this year both live animal and retail meat prices rose sharply. By May they had reached unexpectedly high levels. On the strength of the higher prices for red meats, broiler prices rose and production expanded rapidly. A stronger consumer demand for meat than observed last year supported these higher prices. As we grasped for explanations of this year's very strong demand for meat, thoughts returned to the many discussions that centered around the apparent weak demand for beef in 1977.

For 1978, total red meat production is expected to decline about 3 percent, or 1.1 billion pounds from the 1977 level of 38.7 billion pounds. Much of the decline in red meat production is being offset by larger supplies of poultry. But combined red meat and poultry production will still be only about 400 million pounds, or 1 percent less than in 1977. Compared with 1977, this year's meat production has consisted of considerably more fed beef and poultry, a little more pork, and much less nonfed beef, veal, lamb, and mutton.

The setting for next year is much different now than it was last fall. Prospects for 1979 point to a continued strong demand for meat and lower supplies of red meats. This suggests a rather optimistic outlook for livestock producers since livestock prices are expected to rise. On the other hand, prospects also portray continued increases in retail meat prices, especially for beef cuts, in 1979.

LIVESTOCK PRODUCTION COSTS

Record large corn and soybean crops are being harvested. This will keep feed supplies ample and costs are expected to remain favorable for livestock feeding. Corn prices are expected to inch up from their early fall 1978 level and the farm level price for the 1978-79 crop year may average \$1.95 to \$2.15 per bushel, compared with \$2.03 in 1977-78.

Despite the record large soybean crop being harvested this year, soybean meal prices are running above year-earlier levels. With a continuing strong domestic and foreign demand, soybean meal prices are expected to remain above year-earlier levels through most of 1979. However, as we move into 1979, both grain and protein supplement prices will be greatly influenced by prospects for next year's crops and global demand.

This grain and soybean outlook suggests that livestock feed costs will increase a little in 1979. Nevertheless, feed costs are expected to remain considerably below those of the 1974-77 period.

Feeder animal prices are expected to remain near or above their year-earlier level during 1979. Feeder cattle prices will continue to rise and add to the cost of cattle feeders. Feeder pig prices will probably remain relatively high, particularly during the first half of 1979.

Most other input prices will also rise in 1979. New minimum wage rates and higher social security withholdings will add to labor costs next year. Interest rates are rising and interest costs in 1979 will probably be up from this year. Machinery and building costs will also rise in 1979, as will fuels and energy. All in all, increases in most input costs other than feed and feeder cattle will be closely tied to the rate of inflation.

CATTLE

Some major changes affecting the cattle business have occurred this year—many related to the cattle cycle. But there have been other factors entering the picture and impacting on cattle prices. These other factors have ranged from developments concerning the supplies of competing meats to the general concern over higher retail beef prices.

Inventory continues to decline

The total number of cattle and calves on U.S. farms has been sharply reduced from the record high 132 million head of 1975. The inventory has declined again this year and will probably total around 111 million head on January 1, 1979. This would be a 16-percent drop from the peak in 1975 and the sharpest decline on record.

The cow inventory has also been cut back sharply, from a high of 56.9 million head in 1975 to 49.7 million head at the beginning of this year. The apparent movement of replacement heifers into the beef cow herd has been slow this year. This, combined with a continued high level of cow slaughter through much of the year, will result in a decline in the cow herd this year. It is likely that this year's reduction will be around 2 million head, leaving the cow inventory about 16 percent below the 1975 level. This smaller cow herd suggests that the 1979 calf crop will be smaller than this year's estimated 44.1 million head.

In 1978, the calf crop will be almost as large as the combined cattle and calf slaughter which will be about 44.5 million head. It's very likely that the 1979 calf crop could be 42 to 43 million head and exceed the combined cattle and calf slaughter for the first time since 1975.

Holding of heifers for herd replacements has been slow through most of 1978. But with the higher feeder cattle prices that producers are receiving, it's likely that they will begin holding more heifers for herd replacements. Retention of additional heifers will probably gain momentum during 1979, but many of these will not calve before 1980.

The improved feeder cattle prices are also likely to result in producers culling fewer cows next year. Cow slaughter during 1979 may drop 20 to 25 percent below the 1978 level. This may be sufficient to halt the decline in the cow herd. So, the January 1, 1980 cow herd could be near, or slightly above, the beginning 1979 level. These developments, however, are highly dependent on actions of cattlemen in the next few months.

The decline in the total inventory is expected to be slowed considerably, if not halted, during 1979. Combined cattle and calf slaughter may drop to the 38- to 40-million-head level next year, down 10 to 15 percent from 1978. Then, depending on the size of the calf crop, death losses, and net imports, the total inventory at the beginning of 1980 could once again be around 111 million head.

Feeder cattle supplies down; prices up

The massive liquidation of the cattle herd since 1975 has brought a dwindling supply of feeder cattle. On July 1 of this year, there were about 10 percent fewer feeder cattle outside feedlots than a year earlier.

The expected smaller calf crop for 1979 suggests that the feeder cattle supply will continue to shrink. As herd rebuilding gets underway and more heifers are held for replacements, available feeder cattle supplies will be further reduced. But there are also a couple of offsetting factors. Both calf slaughter and nonfed steer and heifer slaughter are dropping sharply and are expected to continue to do so in 1979. This will help supplement the shrinking supply of feeder cattle as fewer animals will be going to slaughter before spending some time in feedlots.

The smaller supply of feeder cattle, combined with a good demand for them by feedlot operators, has pushed prices sharply higher. Choice yearling feeder steers at Kansas City will average in the upper-\$50's this year, about 45 percent higher than in 1977. Further rises are in prospect for 1979, but the increase is not expected to be nearly as large as in 1978. For 1979, Choice yearling feeder steers will probably average in the mid- to upper-\$60 per hundredweight range.

These higher feeder cattle prices are improving the financial condition of cow-calf producers. With the declining supply of feeder cattle, cow-calf producers are getting in the driver's seat where they are likely to remain for a few years.

Beef production to continue to decline

Despite a higher level of fed cattle slaughter this year, beef production will decline about 4 percent from the 1977 level. All of the decline will come from nonfed beef.

Fed steer and heifer slaughter in 1978 will be up about 7 percent from last year. However, this will not be enough to offset a decline of about 50 percent in steers and heifers directly off grass and cow slaughter which will be down about 13 percent.

The level of placements of cattle on feed has been very large during 1978. As of October 1, 1978, there were 16 percent more cattle on feed in the 23 major cattle feeding States. Placements are expected to continue near or above year-earlier levels through the first half of 1979. This would keep fed cattle slaughter above year-earlier levels through most of 1979.

During 1979, fed steer and heifer slaughter may rise 2 to 4 percent above the 1978 level. But the slaughter of nonfed steers and heifers will probably decline by one-half to two-thirds as these animals continue to be bid out of the reach of packers. Cow slaughter may be down 20 to 25 percent. These likely developments suggest much lower supplies of lean beef next year.

Average dressed weights will rise in 1979 as fed cattle account for a greater percentage of the slaughter and as feeders feed to heavier weights. Thus, beef production may decline only 4 to 6 percent while total cattle slaughter drops 6 to 8 percent.

Further declines in beef production are in store for 1980. As herd rebuilding gets underway, heifers will go into the breeding herd rather than to slaughter. This will further restrict beef production. Combined with less production potential caused by the lower cattle inventory, beef production in 1980 may decline as much, if not more, than it will in 1979.

Fed cattle prices to rise

Prices for fed cattle have increased substantially this year and further increases are expected in 1979. Choice 900-1,100 pound steers at Omaha will probably average about \$52 per hundred weight this year, up almost 30 percent from the 1977 average of \$40.38.

In 1979, fed cattle prices are expected to continue to rise. For the year, they will probably average in the upper-\$50's, or perhaps around \$60. The rise in fed cattle prices, however, will be highly dependent on supplies of competing meats and consumer demand for meats.

The lower supplies of beef in prospect for 1980 suggests that there will continue to be upward pressure on cattle prices. Cattle prices are expected to rise again in 1980, but the amount of the rise will once again be influenced by consumer demand and supplies of competing meats.

Cattle feeders' profit margins to be slim

Profit margins on many of the fed cattle sold this year have been good. Large feed supplies have helped keep feed costs down. Also, many of the fed cattle sold during 1978 were put in feedlots before feeder cattle prices increased very much. This helped cattle feeders turn a good profit when fed cattle prices rose during the year.

But the situation is changing some now. Feeder cattle prices have increased substantially, and this is squeezing profits on cattle being marketed in late 1978. Unless fed cattle prices rise more than currently expected, profit margins in 1979 will probably be very slim given the expected level of feeder cattle prices. In fact, losses are likely at times.

HOGS

Accurate projections of the level of pork production and prices have proven to be a difficult task for most analysts the past few years. Weather, which has traditionally been regarded as the cause of large variations in crop production, was a significant factor determining the level of pork production the last 2 years. The incidence of disease problems has also been greater, and some of this may be related to the severely cold winters.

Several other factors have impacted on pork production. Among these are health concerns, environmental concerns, and changes in the structural characteristics of the industry. These factors may have a more lasting impact on pork production than will weather-related problems, or perhaps disease problems.

Structural changes

In recent years, many changes have occurred in the structure of the hog production industry, and more changes are probable in the future. Many of these changes have no doubt influenced the outcome of decisions related to hog production.

Hog production is located in about the same areas as it has been for several decades. There have been some small interregional shifts, but no dominant changes have occurred. About two-thirds of the pork production comes from the Corn Belt-Lake States. Iowa and Illinois are the top two hog-producing States and account for over one-third of the U.S. production.

There has been a significant decline in the number of farms reporting hogs and pigs on hand during the past four decades. Census of Agriculture data show that in 1940 about 3.8 million farms, or 62 percent of all farms, had hogs and pigs. By 1974, the number of farms with hogs and pigs had declined by 88 percent and only 470,000 farms, or 20 percent of all farms, had hogs and pigs.

There has also been a significant shift in the size of the hog enterprise. Again, based on data available from the Census of Agriculture, we find that in 1964 about 23 percent of the hogs and pigs sold came from farms with sales of 1 to 99 head per year. That same year, only 8 percent of the hogs and pigs sold came from farms with annual sales of 1,000 head and over. However, a dramatic change had taken place by 1974. By this time, the small size group accounted for only 11 percent of the sales while the large size group accounted for 25 percent of the sales.

These data show a definite shift toward larger enterprises. This shift is probably continuing and enterprises with sales much above 1,000 head per year are gaining in importance. Decisions for expanding or contracting these larger enterprises are much different than they are for the small enterprises. Capital investment for these large enterprises is substantial. Thus, once they are built they are likely to operate close to full capacity in order to spread fixed costs.

There is also evidence that points to less seasonality in pork production now than in past years. Traditionally, the March-May period was the larger period for sows farrowing. In 1950, almost one-half of the sow farrowings occurred in the March-May period and about 10 percent occurred in the December-February period. But in 1977, roughly one-fourth of the farrowings occurred in each of these periods. There have been some changes in the other two periods, but they have been much less dramatic and in 1977 each quarter of the year had about one-fourth of the farrowings.

Pork production expanding slowly

Pork production is not expanding as rapidly as most analysts anticipated a year ago, and producer intentions do not suggest a very rapid rise through mid-1979. Pork producers appear to be very conservative in any efforts to expand output. This seems to be especially true considering the size of this year's corn crop and the level of hog prices through most of 1978.

For 1978, pork production will probably rise less than 1 percent above the year-earlier level. There has been less seasonality in production during 1978 than in the past, reflecting the more even distribution of farrowings.

The September 1, 1978, Hogs and Pigs report showed that the inventory of hogs and pigs weighing under 60 pounds was down 2 percent from a year earlier. These hogs will move to market in early 1979 and make up the majority of first-quarter slaughter. While first quarter 1979 slaughter may be near or slightly below a year earlier, production may be up slightly as a result of feeding to heavier weights. However, weather and incidence of disease can once again affect the level of slaughter.

On September 1, producer intentions were to farrow 3 percent more sows in both the September–November and December–February periods. These intentions seem conservative based on hog-feed price relationships, but farrowings for the past year have also seemed conservative.

Pigs farrowed in the September–November and December–February periods will account for most of the second- and third-quarter 1979 slaughter. Even with the 3-percent increases in reported intentions, slaughter in these two quarters could be up more if the winter is milder, the number of pigs per litter is larger, and death losses are less than a year earlier.

It is likely that the spring-quarter pig crop, which will account for fourth-quarter production, will be up by 6 percent or more, twice the intended increase reported for the winter period. This is expected because hog prices will be high and feed costs low during the period when breeding decisions for this pig crop are made. Also, producers will be more assured of large grain supplies.

Based on the September 1 hogs and pigs report, it is anticipated that first half 1979 pork production will be 2 to 4 percent above the year earlier. Production during the second half of the year may be up 6 to 8 percent. This could result in a year-to-year increase of 4 to 6 percent in pork production during 1979.

Hog prices to remain strong

Slaughter hog prices have generally been in the upper \$40's most of this year. Barrows and gilts at seven markets will probably average \$48 to \$49 per hundredweight in 1978, compared to \$41.07 in 1977.

Even though pork production is expected to be larger in 1979, hog prices will probably average near or slightly above the 1978 level. Rising consumer incomes and reduced beef supplies are expected to help support this level of hog prices. However, there will be more competition from broilers, which will temper hog prices.

Barrow and gilt prices may average near \$50 per hundredweight through much of next year. If production expands seasonally in the fourth quarter of 1979 as expected, prices may drop to the mid \$40's, late in the year.

This hog price outlook, combined with prospects for relatively low feed costs, will probably mean that most farrow-to-finish and feeder-pig producers will show a profit in 1979. This may not be so for the feeder-pig finisher who has to buy feeder pigs.

If production and prices develop in 1979 as expected, farrowings in the last half of the year would probably rise above their year-earlier level. This would suggest that pork production would continue to rise into 1980.

OTHER RED MEATS AND POULTRY

During 1978, calf slaughter has been declining sharply. It will probably be 23 to 25 percent below the 1977 level, but commercial calf slaughter will still total about 4.2 million head. More of the calves are going into feedlots for additional feeding rather than to slaughter. This trend is expected to continue in 1979 when calf slaughter could be cut to about one-half the 1978 level. The large grain crops and relatively low feed costs will keep the feedlot demand for calves high. Feedlots will probably bid many calves away from packers next year.

Lamb and mutton production is declining again during 1978. In fact, this year's production may be 12 percent or more below the 1977 level. Declines in production during 1978 have been large considering the size of the 1977 lamb crop and the January 1, 1978 inventory numbers. The 1978 inventory and slaughter statistics suggest that there might have been some additional holding of ewes for breeding during 1978. If in fact this has happened, lamb and mutton production during 1979 could be near, or perhaps slightly above, the 1978 level.

Broiler production has increased sharply during 1978 and will be about 7 percent above the 1977 level. Higher prices for red meats have helped hold broiler prices up even with the larger supplies. Broiler producers' profit margins have been good and this will likely result in further increases in 1979, perhaps in the range of 8 to 10 percent. Turkey production has also increased during 1978. Good profit margins for turkey producers are expected to result in further increases in turkey production during 1979, perhaps 10 percent or more. These larger supplies of poultry products in 1979 will again compete strongly with red meats for the consumer dollar.

CONSUMPTION AND RETAIL PRICES

Per capita consumption of red meats (carcass weight) and poultry will total about 243 pounds in 1978, down about 4 pounds from 1977. Per capita beef consumption will be down almost 6 pounds, while pork consumption will be at about the same level as in 1977. Combined with declines in veal and lamb and mutton consumption, total per capita red meat consumption in 1978 will total about 186 pounds, down almost 7 pounds from 1977. On the other hand, per capita consumption of poultry will be up almost 3 pounds.

Supported by strong consumer demand, retail meat prices rose sharply during 1978. The Bureau of Labor Statistics (BLS) beef and veal price index (1967=100) will average about 200 for the year, up about 23 percent from 1977. The BLS pork price index also rose and will average about 12 percent above the 1977 level. For all red meats, a year-to-year increase of about 18 percent in retail prices is expected during 1978.

In 1979, per capita beef consumption will probably drop 5 to 9 pounds below the 1978 level. Supported by an expected continued strong consumer demand, retail beef prices will probably rise 10 to 14 percent above the 1978 level. Supplies of lean beef will be much lower next year, and this could cause prices for hamburger and manufacturing grade beef to rise more than for cuts such as choice steaks.

Per capita consumption of pork is expected to be larger in 1979, up perhaps 1 to 4 pounds from the 1978 level. Even with a higher level

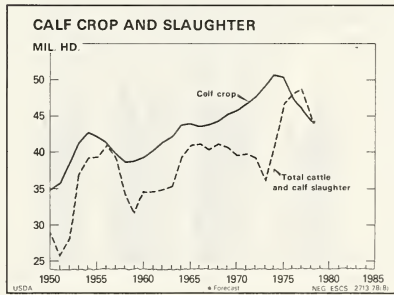
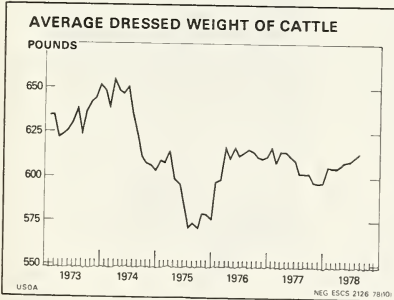
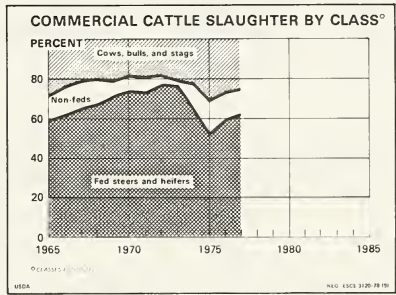
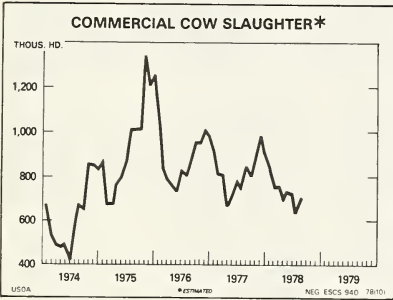
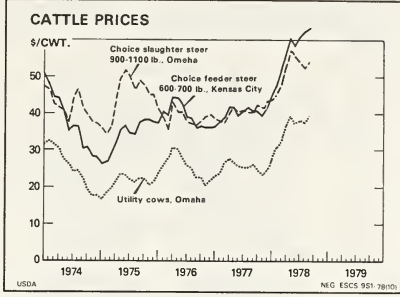
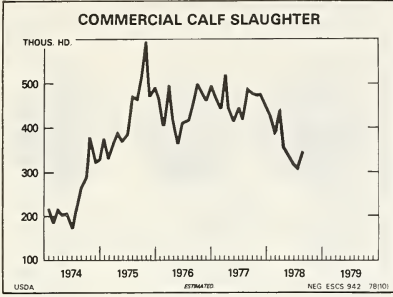
of pork consumption, it is likely that retail pork prices will rise above the 1978 level. This price rise could be in the range of 2 to 5 percent depending on the actual supply of pork and competing meats.

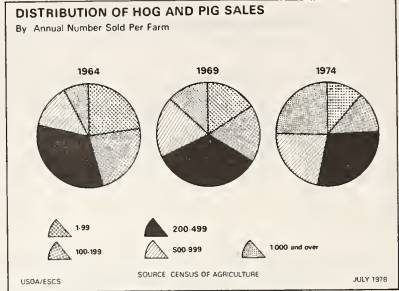
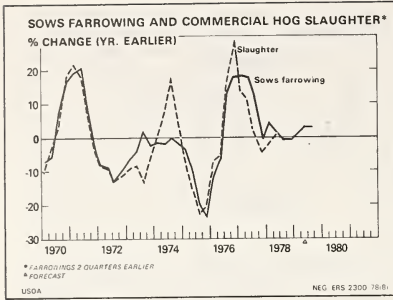
Veal consumption will probably decline sharply again in 1979 and lamb and mutton consumption may hold near the 1978 level.

This all sums up to a per capita red meat consumption of 176 to 184 pounds in 1979, 2 to 10 pounds below the 1978 level. This will likely be accompanied by a rise of 6 to 10 percent in the BLS total meat price index.

Per capita consumption of poultry will be increasing next year, partially offsetting the drop in red meat consumption. The total per capita consumption of red meats and poultry will probably be between 236 and 247 pounds in 1979, compared to about 243 pounds in 1978.

On balance, consumers will still have a large selection of meats from which to choose. And while per capita consumption will be down a little from the last few years, it will still be high relative to historical levels.





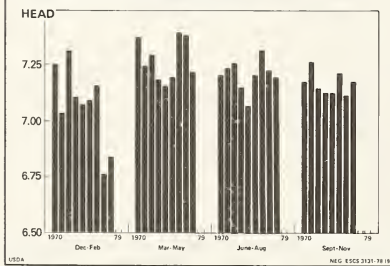
SOWS FARROWING AND HOG/CORN RATIO



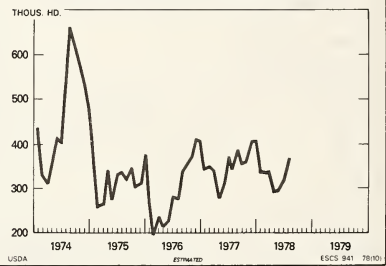
Hog-corn price ratio, Omaha basis

Month	1973	1974	1975	1976	1977	1978
Jan.	21.5	14.8	12.6	18.6	16.4	22.7
Feb.	23.3	13.4	14.1	18.6	16.8	24.0
Mar.	25.4	12.5	14.3	17.7	15.9	22.2
Apr.	23.4	12.1	14.1	18.3	16.0	20.4
May.	19.5	10.2	16.4	17.7	18.8	20.9
June.	16.9	10.0	17.9	17.6	20.7	20.6
July.	19.9	11.2	19.4	16.8	23.8	21.8
Aug.	20.8	10.5	18.6	16.2	26.4	24.5
Sept.	18.4	10.3	20.7	15.1	24.6	24.9
Oct.	17.8	10.6	21.2	13.7	22.6	
Nov.	16.9	11.0	19.4	14.4	19.2	
Dec.	15.7	11.8	18.5	16.4	21.4	
Avg.	19.3	11.3	16.9	16.5	20.2	

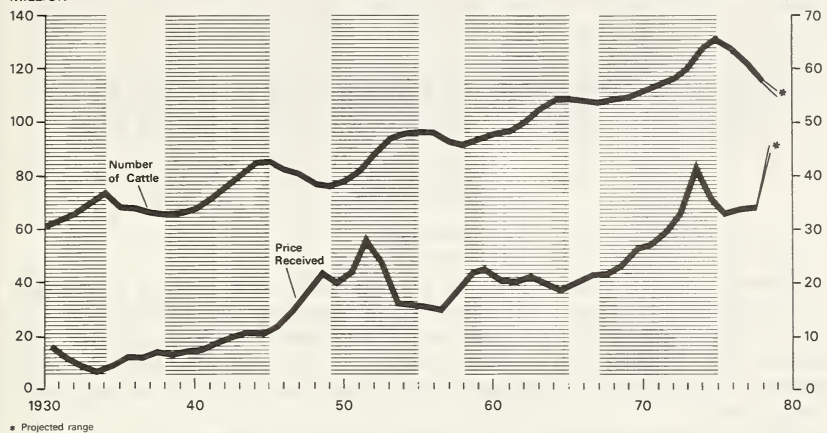
PIGS PER LITTER, 14 STATES



COMMERCIAL SOW SLAUGHTER*

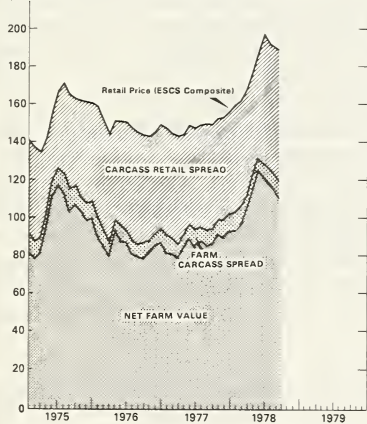


CATTLE CYCLES SINCE 1930:

Cattle and Calves on Farms January 1
MILLIONPrice Received by Farmers for Beef Cattle
\$/CWT

PRICE SPREADS FOR CHOICE BEEF

¢ PER LB

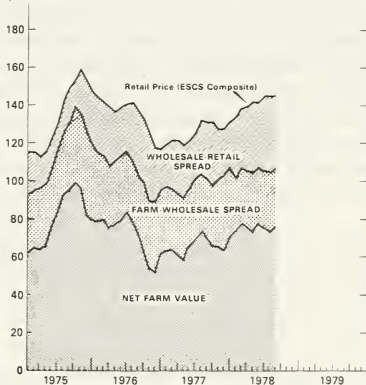


USDA

NEG. ESCS 2575 78/10

PRICE SPREADS FOR PORK

¢ PER LB



USDA

NEG. ESCS 2586 78/10

EMERGING TRENDS IN AUSTRALIA'S LIVESTOCK- GRAINS ECONOMY: IMPLICATIONS FOR TRADE

(By O. T. Kingma, Assistant Director, Bureau of Agricultural Economics,
Canberra, Australia)

There is considerable value at a conference such as this in placing the Australian agricultural scene in perspective. Australian agriculture will almost certainly continue to be oriented toward international trade. The United States has a vital interest in the international markets for livestock products and grains in which Australia also specializes.

The Australian agricultural scene should be interpreted within the framework of dynamic and differential sectoral growth in the overall economy. The current situation and outlook in Australia should also be viewed with reference to the longer term agricultural supply situation, given on the one hand, the residual nature of world agricultural trade, and on the other hand, the high degree of production risk in agriculture—both giving rise to short-term fluctuations in the supply of and demand for agricultural products.

The two parts of this paper are broadly addressed to the above issues. Part 1 summarizes the major results from the Bureau's most recent, and as yet unpublished, medium-term (5-year) projections for Australian agriculture. These projections are then placed in perspective by briefly reviewing, first, the economic conditions confronting the agricultural sector in smaller, exporting countries such as Australia; second, reactions on the part of producers to these economic conditions; and third, whether international stabilization policy has anything to offer in terms of influencing the environment for trade in agricultural commodities.

In the context of economic development, the Australian and United States agricultural sectors have many similarities. In both countries, agriculture is declining relatively within the economy. Thus, the degree to which productivity increases can be achieved to enable continued competition for national resources is of paramount importance. Relatedly, questions of the role of Government in facilitating change and ensuring a viable agricultural sector are widely debated.

When it comes to markets for agricultural products, however, the situation is somewhat different. The United States is a major world producer and, inevitably, exporter of many agricultural products. The size of the U.S. agricultural sector is such that it is capable of influencing world agricultural prices. In addition, the U.S. domestic market is large and U.S. national agricultural policies have a considerable impact outside the United States. Australia, on the other hand, whilst having a comparative advantage in grain and meat

production, is in most products a price taker on world markets simply because of the size of the agricultural sector. Australia's domestic market is small. On the export side our voice is therefore more closely akin to that of the smaller and in many cases still developing countries, characterized by export orientation and a high degree of vulnerability to even minor swings in world prices. Security of food supplies, of relevance to the developing countries generally, is, however, not of concern in the Australian domestic market.

1.—Agricultural supply projections, 1982–83

The Bureau's third set of medium-term (5-year) projections for Australian agricultural commodities has been recently completed. These are revised regularly in an endeavour to take account of seasonal changes in the production and marketing of the major products. While only the major results of these projections are presented below, the conditional status of the projections is highlighted in the final report. The report also contains a review of the underlying assumptions and sensitivity analyses for key explanatory variables.

The Bureau now has a complete, albeit still developing, analytical base for simulating short- and medium-term future situations in the major agricultural industries. These econometric models are used regularly, together with necessary judgments, to provide short- and medium-term forecasts.

Projections are influenced by interrelationships between commodities. Thus, the projections are carried out in two steps. First, individual commodity projections are made from the econometric models, taking account of broad relationships between industries. Major features of each commodity/industry are then combined into the Bureau's mathematical programming model of the sheep, beef, and cropping industries to obtain an overall set of projections for the agricultural sector. This two-phase method ensures some consistency both between industries and relative to the resource base.

1.1. The current agricultural outlook.—For Australian farmers, 1978–79 is shaping up to be a good year. Gross value of production is expected to be over 10 percent higher than the record level of last season (table 1). This improvement is attributable in part to moderate increases in prices received for most commodities, but also to a rise in the overall volume of rural output, particularly of grains. Farm costs are expected to continue to rise. However, net income per farm is expected to be some 30 percent above the low levels of the past 3 years (table 2). The situation, though varying for individual industries, reflects a general recovery in market prospects, some improvement in growth prospects for Australia and major trading nations, and the assumption of a return to average seasonal conditions.

1.2. Some results from the projections (1982–83).—Projections of the aggregate volume and value of production of rural products to 1982–83 are shown in tables 1 and 2. The total volume of rural output is still projected to rise from the base level, but this reflects a downward revision from earlier judgments. The volume of agricultural exports is also projected to remain high, indicating Australia's continuing role as a major exporter of rural products—and in turn, the continuing influence which overseas market developments are likely to have on Australian agriculture. Principal constraints on agricultural production in Australia are likely to continue to be of an economic nature

stemming largely from profit considerations, uncertainty in production, and economic growth of the major trading countries, and restrictions on overseas markets.

Beef and veal (table 3).—Output in 1978–79 is forecast at 1.82 Mt, a decline of 14 percent from the previous year's record output. Saleyard offerings are forecast to be lower reflecting a smaller cattle herd and reduced slaughter rates associated with a return to more normal seasonal conditions. We expect export prices for Australian beef to increase in 1978–79 and this, coupled with reduced offerings in Australia, is expected to result in increases in saleyard prices of at least 35 percent. Exports of beef and veal in 1978–79 are forecast at 1.02 Mt, similar to levels of around 1 Mt in the previous 2 years.

TABLE 1.—VOLUME OF RURAL OUTPUT AND INPUT AND FARMERS' TERMS OF TRADE

[Index numbers]

	1968–69 equals 100			Average 1960–61 to 1962–63 equals 100		
	Volume of output	Volume of input	Output: input ratio	Prices received (P_r)	Prices paid (P_p)	Terms of trade (P_r/P_p)
1970–71.....	99	95	104	97	126	78
1971–72.....	105	93	113	106	133	79
1972–73.....	97	96	101	144	143	101
1973–74.....	101	94	107	168	165	101
1974–75.....	107	85	126	148	215	69
1975–76.....	113	78	145	155	251	62
1976–77.....	116	74	157	173	281	62
1977–78 ¹	114	71	161	179	310	58
1978–79 ²	116	70	166	196	335	59
1982–83 ²	109	64	170	-----	-----	-----

¹ Subject to revision.² Estimated by BAE.

Source: Australian Bureau of Statistics and Bureau of Agricultural Economics.

TABLE 2.—GROSS RETURNS, COSTS AND INCOME

[In millions of dollars]

	Gross value of agricultural commodities	Farm costs	Farm income ¹	Income per farm ² (dollars)	Index of real income per farm (average 1970–71 = 100 ³)
1970–71.....	3,566	2,664	897	4,692	70
1971–72.....	3,957	2,743	1,165	5,977	96
1972–73.....	4,957	3,051	1,779	9,400	134
1973–74.....	6,412	3,482	2,060	15,924	201
1974–75.....	5,878	4,061	1,753	9,638	105
1975–76.....	6,175	4,357	1,818	10,077	89
1976–77.....	6,771	4,636	2,135	12,297	96
1977–78 ⁴	6,876	4,784	2,092	12,270	87
1978–79 ⁵	8,150	5,250	2,900	17,300	115
1982–83 ⁵	8,300	-----	-----	-----	-----

¹ Including adjustments for changes in the value of stocks from 1959–60 to 1975–76.² From 1974–75 income per establishment (see ABS, 7102.0).³ Income per farm deflated by Consumer Price Index.⁴ Subject to revision.⁵ Estimated by BAE.

Source: Australian Bureau of Statistics and Bureau of Agricultural Economics.

Projections for beef and veal are sensitive to the nature and extent of recovery in the beef market. Export demand for Australian beef is likely to continue to strengthen in the next 2 years and remain at

high levels for the remainder of the projection period. Reduced U.S. production coupled with increasing U.S. consumer demand for lean beef points to higher beef prices and greater import demand over the projection period. This situation, an expanding Japanese market and continuing exports to Canada, South Korea and Middle East should mean a ready outlet for Australian supplies.

Beef prices in Australia have varied about a 3 percent upward trend from 1950-51 to 1977-78. In 1974-75, beef prices dropped from 40 percent above to 40 percent below this trend and since then have remained well below trend. My judgement is that beef prices will approach the long-term trend by 1982-83. Saleyard prices for cattle in Australia are anticipated to double from 50 c/kg (1977-78) to over 100 c/kg in 1982-83. Allowing for inflation, this implies increases in the real price of beef at saleyard of 8 to 10 percent a year.

Under this scenario, the present decline in Australian cattle numbers will reverse. By 1982-83 the herd is again likely to be around 30 million head. However, due mainly to a reduction in slaughter rates from recent record high levels, total production in 1982-83 is not likely to be much greater than 1.7 Mt (table 3). Because of increased prices, consumption of beef in Australia is expected to decline over the projection period. Hence beef available for export is likely to be above 1978-79 levels (table 3).

TABLE 3.—MEAT: AUSTRALIAN SUPPLY AND UTILIZATION

[Mt, carcass weight equivalent]

Item	Average, 1970-71 to 1974-75	Actual			Forecast, 1978-79 ²	Projected 1982-83
		1975-76	1977-78	1977-78 ¹		
Beef and veal:						
Production.....	1.29	1.84	1.99	2.11	1.82	1.69
Domestic use.....	.60	.96	.98	.90	.77	.71
Exports.....	.65	.80	.94	1.11	1.02	.92
Lamb:						
Production.....	.30	.26	.24	.25	.25	.35
Domestic use.....	.26	.23	.20	.20	.19	.27
Exports.....	.04	.03	.04	.05	.06	.08
Mutton:						
Production.....	.41	.32	.30	.27	.25	.27
Consumption.....	.19	.10	.06	.04	.05	.08
Exports.....	.21	.21	.22	.23	.19	.21
Total meats: ³						
Production.....	2.00	2.42	2.53	2.63	2.32	2.42
Consumption.....	1.05	1.29	1.24	1.14	1.02	1.03
Exports.....	.90	1.04	1.20	1.39	1.26	1.21

¹ Preliminary Australian Bureau of Statistics and Bureau of Agricultural Economics estimates.

² Projected figures are based on "average" seasonal conditions. Apparent discrepancies in the totals are due to marginal estimated changes in stocks and the fact that canned meats are now shown.

³ Excludes pigmeat and poultry.

A more rapid rate of beef price increase than assumed above could mean a more rapid increase in beef numbers in Australia with production increasing strongly towards 2 Mt by 1982-83. However, this scenario is critically dependent on high beef prices in the short run to encourage disillusioned Australian producers back into high levels of beef production. Our analyses indicate that the Australian herd is unlikely to rebuild substantially in the near future if prices fail to rise above 65 c/kg by 1982-83.

The United States is still by far Australia's largest market for beef. Our production is very much influenced by U.S. import policies and,

as can be expected, there has been nervousness in the Australian meat industry during the recent debate on the U.S. import law.

It seems to me that these laws are to a large degree based on two erroneous beliefs.

The first belief is that the U.S. beef industry can be stabilized through the regulation of imports. Imports of beef to the United States constitute only some 7 percent of total U.S. consumption. Attempts to stabilize the industry through anticyclical import legislation is therefore futile. Establishment of stable and predictable, albeit limited imports to the United States would seem much more logical and would certainly be more acceptable to Australian producers.

The second erroneous belief is that the Australian beef industry is characterized by a well-defined beef cycle. This is not true. The Bureau's analyses indicate that there is no cattle cycle in Australia and that saleyard prices are very much determined with reference to the beef industries in major importing countries. For the bill to be effective, it would therefore have to induce a cycle in Australia. If such attempts to create a cycle are coupled with the variability caused by climate in our rangeland-based beef sector, the resultant income instability would transform beef production to an extremely high-risk venture. In such circumstances it is doubtful whether the increased supplies needed to meet expanding demand for lean beef in the United States would be forthcoming.

Sheep meats (table 3) and wool (table 5).—Although not as important as in past years, the Australian sheep industry still contributes over 20 percent to the gross value of rural production. Sheep numbers in Australia have been steadily declining during the past 3 years, and this trend is likely to continue in 1978-79 when numbers are expected to be 131 million. However, with continuing strong export demand for sheep meat and live sheep and steadily rising prices for wool, this trend is likely to reverse with the flock reaching approximately 143 million by 1982-83.

The increased export demand for sheep meats and live sheep is expected to come largely from the Middle East countries, but also Japan and Korea. The Bureau's recent detailed analysis of the Middle East market, which explored both the likely future demand for sheep meat and the potential of the Australian flock to supply world markets, indicates that live sheep exports are likely to remain close to 1977-78 levels—around 4.5 to 5 million head. Only marginal increases in mutton exports are expected, above 1978-79 levels. However, exports of lamb, largely to Iran, are likely to double by 1982-83 (table 3), more than compensating the loss of additional markets.

There has been some firming of the wool market in the past two seasons. This trend seems likely to continue. On the supply side, world wool supplies and stocks held commercially and in exporting countries are anticipated to remain restrictive. Prospects for some recovery in economic growth in wool-consuming countries should improve the demand for wool. However, despite rationalization of production in the manmade fiber industry, competition from manmade fibers is expected to remain strong. No sharp upward or downward movement in wool prices is therefore expected.

Given the above, and bearing in mind the expansion in the meat trade with the Middle East, the Bureau's judgment is that Australian wool production and exports are likely to increase marginally over the projection period to around 770 kt.

Grains (table 4).—Australian wheat production in 1978-79 is forecast at around 13.8 Mt. This is some 48 percent higher than in 1977-78, resulting from a 3 percent rise in area planted (10.3 million ha) and above average rainfall in the Wheat Belt. World wheat production is likely to be close to the record of 1976-77, and there is some expectation of further increases in world wheat stocks. Taking into account policies of the major world traders in grains and the numerous imponderables that make forecasting a hazardous business, average f.o.b. export price for Australian Standard White seems likely to be around \$110/t in 1978-79 or some 10 percent higher than the estimated 1977-78 average.

TABLE 4.—GRAINS: SUPPLY AND UTILIZATION

[kt]

Item	Average 1970-71 to 1974-75	Actual			Forecast, 1978-79 ²	Projected, 1982-83 ³
		1975-76	1976-77	1977-78 ¹		
Wheat:						
Production.....	9,286	11,982	11,667	9,299	13,800	12,790
Domestic use.....	2,995	2,742	2,467	2,512	2,600	3,119
Exports.....	7,383	8,233	9,763	2 8,260	8,500	9,600
Coarse grains:						
Production.....	4,794	5,575	5,019	4,168	6,445	5,764
Domestic use.....	2,370	2,015	2,277	2,297	2,630	2,808
Exports.....	2,424	3,560	2,742	1,871	3,815	2,956
Total grains: ³						
Production.....	14,080	17,557	16,686	13,467	20,245	18,554
Domestic use.....	5,365	4,757	4,744	4,809	5,230	5,927
Exports.....	9,807	11,793	12,505	10,131	12,315	12,556

¹ Preliminary Australian Bureau of Statistics and BAE estimates.

² BAE estimates.

³ Wheat and coarse grains.

TABLE 5.—AUSTRALIAN WOOL: SUPPLY AND UTILIZATION

[kt greasy]¹

Item	Average, 1970-71 to 1974-75	Actual			Forecast, 1978-79	Projected, 1982-83
		1975-76	1976-77	1977-78		
Production.....	800	754	703	677	2 685	770
Domestic use.....	33.9	23.9	30.9	26.8	NA	NA
Exports.....	625	624	743	617	NA	NA
Supply stocks (kt clean):						
Carryover.....	14	15	13	11	NA	NA
AWC stocks.....	42	137	116	95	NA	NA

¹ Note that figures do not balance due to some unrecorded stock carryover between years.

² Official forecast by Australian Wool Production Forecasting Committee, Nov. 10, 1978.

Australian wheat prices follow movements in U.S. prices. In 1976-77 they fell approximately 35% below 1973-74 levels, due largely to a record world harvest in 1976-77 and reduced import demand, and growth of world stocks. World grain stocks have continued to grow since, particularly in the U.S. where some three quarters of major exporters' stocks of wheat and coarse grains are now held.

Management of these world stocks is crucial in determining stability in the world grain market. There is considerable interest on the part

of exporters like Australia, concerning the operation of the U.S. Government's 1977 farm legislation, CCC and PL 480 programs and the outcome of international negotiations for wheat and coarse grains. The projections are based on the proposition that recent policies of the major grain trading countries will be maintained in the period under review.

Though providing a buffer against price fluctuations, the present magnitude of grain stocks diminishes prospects for a significant price recovery in the short term. The policies which have contributed to the holding of these stocks provide some basis for believing that they will not suddenly become a major market depressing influence. However, the question is whether the same policies will bring about further expansion of production. If so, and if at a rate faster than the rate of growth of consumption, then one year's bumper crop can disrupt market prices perhaps inducing an abrupt change in policy. My judgement is that major exporting countries are likely to implement collectively or individually policies to attempt to reduce (or at least contain) world grain stocks from their present high levels by 1982-83.

Indications are that world consumption of wheat is likely to increase in line with past growth rates of around 3% a year. Main growth in wheat imports is expected to come from developing countries. The Bureau expects world consumption of coarse grains to increase at slightly more than historical rates, particularly in developed countries in view of the likely increased demand for livestock products.

Given the above, a range of further assumptions and further assuming continuation of past levels of technological growth in Australia (table 1) and normal seasonal conditions, Australian wheat plantings in 1982-83 are projected at 10.8 million ha producing 12.8 Mt. Coarse grain (barley, oats, sorghum) plantings in 1982-83 are projected at 4.5 million ha, producing 5.8 Mt. Domestic utilization of wheat and coarse grains is projected to rise due to some expected expansion in feed wheat used for livestock. Wheat available for export is projected at 9.6 Mt, 30% above the average shipments of 1970-71 to 1974-75.

In the decade to 1977-78, Australian wheat exports have averaged around 13% of global world trade with a range of approximately 8-17%. This variability, reflecting the sensitivity of production to both economic and seasonal factors, makes prediction of grain exports extremely difficult. If one or more of the assumptions do not hold, and if recent cost increases and unstable market conditions continue, then total Australian exports could be as low as 8 Mt by 1982-83.

An International Wheat Agreement (IWA) conceptually provides a means of improving world food security, stabilizing world prices and supplies of grain and improving dialogue between exporting and importing countries. In the present negotiations for an IWA, Australia is required eventually to hold reserve stocks of wheat to be held/released under specific trigger price conditions. In principle this is fine. However, Australia has expressed some concern about the absence of relief arrangements from these stockholding obligations, for smaller exporting countries.

Because of climatic variability, Australian production might fall in years when addition to stocks is indicated by the global formula.

Thus, the mechanism could exacerbate instability of supplies from Australia and other smaller exporters. Australia would lose traditional markets to larger exporters for whom the global formula more reliably indicates retention/release of stocks.

A further problem concerns the harmonization of IWA trigger prices and those set domestically in the U.S. There is a strong possibility that the price indicator will only trigger the reserves release mechanism if Russia, China, and India, either individually or collectively, increase their imports. If the indicator scale for the U.S. domestic support programme is set below the IWA scale, then the U.S. will have a competitive advantage in meeting this increased demand by releasing stocks held under the producer storage program, while Australia is still committed to holding reserve stocks. To the extent that U.S. nonreserve stocks are sufficient to accommodate an increase in demand, Australian stocks held under the IWA will tend to be redundant for stabilization purposes. They will be held at high cost for world food security purposes only.

2.—*Supply situation in perspective*

I would now like to place these projections in perspective by briefly reviewing the pressures facing the agricultural sector in countries like Australia. I will then outline the major measures taken by producers to offset these pressures. Despite measures taken, and some prospect of improved incomes in the short term, a substantial number of Australian farmers will continue to earn relatively low incomes. Hence, in concluding, I will question whether anything can be done in the area of international stabilization to alleviate this situation.

Part 1 has given indications of a return to trend in terms of trade for Australian agriculture. However, this is a short-run feature. My judgment is that while short-run factors will continue to generate depression periodically, as in the last 4 years, and prosperity as hopefully for 1978–79, over the longer term farmers' input prices will continue to rise faster than the prices they receive for their products. There is little prospect of this trend being halted or reversed since this is related to both *internal* pressures concerned with development of the Australian economy and *external* pressures arising from characteristics of export markets.

In Australia, the agricultural sector is effectively declining in relative importance in the economy. Agricultural exports are now less crucial in determining the balance of payments. What is good for agriculture is now not necessarily coincident with what is good for other sectors of the economy. When objectives are in conflict, the reduced political influence of farmers means that governments are now less likely to implement policies which favour agriculture to the detriment of growth in the overall economy. Survival of agriculture therefore depends increasingly on its capacity to attract and compete for national resources—this is the internal pressure facing the rural sector.

2.1. *Export markets.* External pressures arise through the export orientation of agriculture and, given the above internal pressures, the necessity to operate only on remunerative markets without government support. What this means is that increasing world food needs are going to have to be expressed in terms of purchasing power to justify the committal of resources by Australian primary producers.

National commitments for aid and assistance to other countries aside, only if producers are able to generate sufficiently high returns from their investments can they complete for national resources. Export orientation implies an agricultural policy aimed at facilitating development of rural resource base consistent with profitable markets.

Export oriented countries like Australia face significant problems in operating on world agricultural commodity markets. Australian agricultural exports generally constitute only a small proportion of world trade and accompanying this Australia is a price taker on world agricultural markets. As such, trading problems facing Australian agriculture are no different from those facing a large number of small trading nations, and particularly underdeveloped countries. Countries such as these face agricultural markets characterized by periodic surpluses and deficits caused essentially by domestic food self sufficiency policies in developed countries. They are also characterized by institutional restrictions which make the residual free market highly volatile. Accommodation of economic fluctuations caused by these surpluses or deficits is increasingly left to countries operating in a diminishing free world market.

I recognize that differences between policies of individual countries do exist. However, the inequity is that, while aiming for some increase in food security (self sufficiency) may be valid for a particular country, such countries, responsible for abrupt shifts in demand and supply on world markets, pay no price (other than affecting their own consumers and taxpayers) for the costs imposed on other countries. Suppliers of agricultural products are highly vulnerable and have tended to receive little premium for regularity of supplies. In fact, residual world markets for agricultural products are a prime example of market failure.

2.2. Positive reactions to adverse economic conditions. It is not useful to dwell too much on the negative side. Instead I would like to outline the positive moves which are being made in areas such as increasing productivity and changing trading patterns to accommodate current market pressures.

Productivity increases. Table 6 shows the marked change in the level and distribution of incomes that have taken place in the Australian grazing industry (beef, sheep, crops). Some 120,000 of Australia's 170,000 producers are included in these industries. Bearing in mind that large fluctuations within individual industries have been averaged in this table, the figures illustrate that a large proportion of farmers have in fact been able to improve their economic situation in the face of adversity. This has been achieved through rationalization of production systems.

This rationalization has manifested itself in impressive increases in productivity (table 1). Productivity increases in turn, have been achieved by a slowing in the growth of aggregate output in association with a much sharper reduction in the volume of inputs used (table 1). The latter has been characterized by substantial cost-cutting across inputs, a slow down in capital expenditure, a reduction in the number of high-cost farms together with restructuring of farms, and continued reduction in hired labour and the labour input of sole ownership farms through use of strategies such as off-farm work.

TABLE 6.—DISTRIBUTION OF AUSTRALIAN GRAZING INDUSTRY PROPERTIES: BY NET CASH INCOME:¹ 1974-75 TO 1977-78

	Under zero	Zero and under \$5,000	\$5,000 and under \$10,000	\$10,000 and under \$20,000	\$20,000 and over
1973-74.....	3.6	62.1	8.1	12.2	14.0
1974-75.....	10.1	61.4	8.2	9.6	10.7
1975-76.....	22.4	21.7	16.6	18.7	20.7
1976-77 ²	18.6	20.1	11.9	19.5	29.8
1977-78 ³	20.1	20.3	17.8	19.7	22.1

¹ Net cash income is defined as total cash receipts from farm producer and services minus total cash (onfarm) production costs including labour, materials and services, rent, interest and livestock purchases.

² Estimated from 1975-76 AGIS.

³ Projected, using 1975-76 BAE Survey data, and more recent Australian Bureau of Statistics data.

The result of this is that a degree of polarity has developed in terms of both profitability (table 6) and efficiency, meaning that a sub-set of profitable farming operations has emerged on which productivity improvements are more than sufficient to offset the adverse economic conditions. Equally there is now a sizeable core of low income producers in Australian agriculture. Many of these producers stand little chance of long-term economic survival.

It is my judgement that conditions on international agricultural markets have contributed significantly to this low income situation. Increased uncertainty facing these producers is largely due to both abrupt limitations on access to previously reliable markets and relatedly, to increased fluctuations in agricultural prices. Resulting low incomes and attendant losses on investment are an unnecessary drain on producers—a drain which could be eliminated with rationalization of world trade policy.

Changes in trading pattern. The second positive reaction on the part of countries like Australia to a disruptive world trade is to make substantial adjustments in trading patterns, involving diversification to a large number of new and inevitably smaller markets. While this diversification has some stabilizing effect, individual markets tend to be less well known and consequently more uncertain.

For Australia both the U.K. and E.E.C. markets which absorbed about 30% of Australian exports annually in the late 1950's accounted for less than 10% by 1975. At the same time increases in export flows have occurred to Japan, U.S., and centrally planned and Third World countries. Japan, Australia's single most important customer, now accounts for 25% of rural exports, with North America and other countries taking around 20% and 45%, respectively. The dollar value of Australia's rural exports to centrally planned and developing countries has increased some 50% over the last decade.

The problem facing countries like Australia with an export-oriented rural sector and comparative advantage in agricultural trade is that any major effort to plan agriculture is fraught with difficulty. Despite attempts at diversification, problems still persist in the areas of, for example:

Changes in intervention and subvention in the E.E.C. and Japanese and to a lesser extent North American markets.

Stop/go purchasing policies of the centrally planned economies.

The degree of political interference in trade with many Third World countries.

Until issues of this nature are seriously addressed, agricultural booms and busts now being experienced on a world scale are likely to increase, not diminish, in severity.

2.3. International stabilization. I have talked about the upheavals in domestic agriculture as a result of protective agricultural policies in developed countries. I have mentioned the positive attempts made to counter these influences. However, despite the efforts which have gone into negotiating a better deal for agriculture, and the massive productivity increases in the farm sector in recent years, low incomes in agriculture still persist. The question therefore arises whether *anything* additional can be done in the area of international stabilization to improve decisionmaking in agriculture—the answer is yes.

The ingrained philosophy that costs imposed by market fluctuations in agricultural prices and production are severe and should be eliminated or reduced pervades the agricultural policies of most developed countries. This has led to a preoccupation with domestic price stabilization schemes in some form, intervention being with the express purpose of altering price or quantity movements from those which would otherwise occur. These schemes have inevitably shaded into price support accompanied by supply controls.

Price support has been one of several methods whereby a high degree of protection has been afforded agriculture in developed countries. However, despite the fact that high farm prices do not represent the solution to the farm problem, almost no serious consideration is being given to the gradual reduction of the present levels of protection in agriculture.

Domestic stabilization has involved price support and domestic market insulation. International stabilization policies have largely involved attempts at overlaying these domestic policies with further price stabilization schemes using buffer stock and pricing arrangements. It would be fair to say that distortions caused by domestic policies have simply been compounded internationally with this approach.

For international stabilization to be effective, attention must first be focused on rationalization of *domestic* agricultures. Domestic policies have inevitably taken precedence over general commitments to liberalization in international trade. Comparative advantage has yielded to other considerations as a major determinant of the volume, composition, and allocation of agricultural production. The situation now is that modification of these (protective) institutions to correct distortions in the agricultural sector can only come about through concentration on domestic policies aimed at facilitating structural change.

Because the deleterious effects or costs of instability in agricultural commodity markets are borne by producers and consumers in individual countries, and are most marked at the individual producer and consumer level, domestic policies aimed directly at stabilizing the economic position of these producers/consumers as opposed to stabilizing through market intervention, are likely to be the most successful. Such policies can be undertaken within any country but because social welfare preferences are likely to differ between countries, blanket international policies (to achieve domestic objectives) are unlikely to be appropriate.

Despite this, there is a role for international stabilization in the above context. Rationalization of *domestic* agricultural policies could be enhanced by a much more rigorous approach to *international* policy development—an institutional framework within which

Prices can be more easily established with sufficient reliability to encourage longer term investment.

Appropriate stocks and trade volumes can be more easily determined and regulated without abrupt changes in access.

Agreements can be more automatically achieved.

Levels of protection can be more automatically rationalized.

International negotiations to achieve the above are still crucial to ensure continued access to markets—stabilization in this context really becomes a *euphemism for orderly marketing*, not the restricted concept of price stabilization.

Similarly international cooperation or political good will is necessary for the progressive removal of trade inhibiting barriers. However it should be stressed that attempts to achieve this objective through equalization of effective rates of protection between countries, or approaches based on “joint disciplines” are conceptually unsound.

3.—*Summary*

I have briefly reviewed features of the Australian rural outlook for 1978–79, described as somewhat optimistic after a successive number of years during which terms of trade facing agriculture were well below estimated trend. I then discussed likely changes in output of Australian rural industries in the next 5 years or so. Results of the Bureau’s 5-year projections to 1982–83 indicate that apart from dairy products, agricultural production and exports are likely to continue at high levels. Cautiously optimistic projections were presented for beef, sheep meat, grains, and wool.

This situation was then interpreted against the background of economic change in which the rural sector was seen as dynamically adjusting to both short-run market fluctuations, the effects of restrictive world trade policies and to longer term underlying forces of economic development. There have been substantial increases in productivity in Australian agriculture in recent years. However, despite these increases, diversification of market outlets and international efforts to improve the reliability of world agricultural commodity markets, a substantial number of Australian producers are continuing to earn low farm incomes.

An important question is whether international stabilization policy can in fact reduce the unnecessarily high degree of uncertainty facing producers in exporting countries. My conclusion is that a more rigorous approach to international policy formulation can help significantly if directed primarily at first, rationalization of *domestic* agriculture in individual countries with progressive dismantling of protective barriers to trade, and second, developing more automatic and reliable *international* mechanisms/procedures for negotiating agreements and establishing prices to encourage longer term investment.

OUTLOOK FOR TIMBER PRODUCTS

(By Robert B. Phelps, Forester, Forest Service, USDA)

Few timber products are consumed by individuals in the form in which they are manufactured. Instead, most move to various major markets where they are remanufactured or made a part of a product that is ultimately used by individual consumers. Thus, although consumer demand is the underlying force, direct demand for timber products is largely determined by the levels of activity in their primary end-use markets. So before discussing demand for the various products, I will briefly review trends in these markets and take a look at current estimates of their strength this year and early in 1979.

DOMESTIC MARKETS

Overall economic activity as measured by the gross national product, the most comprehensive indicator of total economic activity, rose at an annual rate of 3.4 percent (measured in 1972 dollars) in the third quarter, somewhat under the 4.2 percent recorded during the first half of 1978. Most other economic measures, including employment and personal income, also increased. These trends tend to support recent Government and private forecasts which indicate that growth in the overall economy will continue at a somewhat slower rate in the last months of 1978 and in 1979.

Activity in most of the major domestic timber products markets has also been increasing in 1978. However, the general outlook for the remainder of the year and for 1979 is somewhat mixed, with declines in some major markets but with continued upward trends in others.

A key determinant of the demand for many timber products is construction activity, and most particularly, residential construction activity. Housing is the Nation's most important market for softwood lumber and plywood, and a major consumer of many other timber products such as hardwood plywood, particleboard, and insulation board. And not only is it a large direct consumer of wood, but it provides the stimulus for homeowner purchase of many manufactured goods, including household furniture. Furniture production, of course, is a key manufacturing use of hardwood lumber, plywood and veneer, hardboard, and particleboard.

In 1975, starts of new housing units dropped to 1.17 million units, the smallest yearly total since just after World War II. Since that time, housing construction has been increasing. Total starts in 1976 were up nearly a third to 1.55 million units, and in 1977 they rose again to nearly 2 million, some 29 percent above construction in 1976. This year, after dropping sharply in January and February due to unusually bad weather, the upward trend continued, though at a slower pace. Preliminary data indicate that the seasonally adjusted

annual rate of new private housing starts during the first three quarters of 1978 was about 1.97 million units, just slightly above the 1.91 rate for the first three quarters of 1977. More than 7 out of 10 of the units started so far in 1978 have been single family. This is very near the ratio in both 1976 and 1977 and has special significance for the timber industries because wood products use in single-family units is normally much larger than in other types of housing.

Building permits, an indicator of future starts, are also very near year-earlier levels. Through the first 9 months of 1978, about 1.3 million permits were issued. A somewhat smaller percentage of these have been for single-family units, than in 1976 and 1977.

Mobile homes have been recovering somewhat more slowly from the low of 3 years ago than have conventional units. Through the first 9 months of this year shipments have equaled an annual rate of almost 270,000 units—about 4 percent above the total for 1977.

Despite the continued apparent strength, there are indications that housing construction activity may decline somewhat late this year and continue down in 1979. Although showing some fluctuation, starts in both August and September were down from the rates in June and July. In early fall, interest rates were moving up rapidly and there were some questions whether the savings and loan associations could sustain the continued inflows of funds for mortgage lending of the past few months. In addition, prices of new houses were continuing to rise, and some shortages of materials and labor were being reported.

Based on trends for the year and on these various factors, most housing analysts now expect that starts for 1978 may reach 1.95 million units. Although they are expected to compose a slightly smaller proportion of the total, it is likely that 1978 will be second only to 1977 in the total numbers of single-family units started.

Some additional decline is probable in 1979 if credit and other conditions are affected as expected by the recently announced programs to curb inflation. Because of changes in the mortgage markets, however, the declines may not be as severe as in past housing cycles. As a result most forecasts indicate a decline in total starts to about 1.65 to 1.70 million units. A slightly smaller proportion of single-family starts is also likely.

Expenditures for residential upkeep and improvements have been rising sharply in 1978 as many homeowners apparently met their needs for additional space by alterations and remodeling rather than purchase of new homes. Expenditures in the second quarter of the year were at a seasonally adjusted annual rate of \$38.3 billion, some 17 percent above the first quarter expenditure level, and 25 percent more than in the second quarter of 1977. Some leveling of this trend can probably be expected in the last half of the year.

In contrast to housing, nonresidential construction activity showed a strongly rising trend during the first half of 1978. At midyear the seasonally adjusted annual rate (measured in 1972 dollars) was 16 percent above 1977. The value of contracts for future nonresidential construction was also substantially above 1977. This along with anticipated increases in expenditures for new plant and equipment suggests

the probability of continuing expansion in the last half of the year and into 1979.

Industrial output—an important indicator of the demand for pallet lumber, container board, and some grades of paper—increased steadily through the first 8 months of 1978 rising from an index value of 137.1 (1967=100) in December 1977 to 146.6 in August. Container production, a large market for paperboard hardboard, veneer, and some grades of lumber, was following the same upward trend. Output of the furniture and fixtures industry—a major end-user of hardwood lumber, plywood, and veneer, and of particleboard, and hardboard—was 12 percent above 1977 at the end of the first half of 1978. Some further increase in most of these important markets are likely, if the economy continues as indicated above.

INTERNATIONAL MARKETS

The United States is the world's leading importer of timber products—chiefly lumber, woodpulp, and paper and board from Canada and veneer and plywood from Southeast Asia. The total value of these imports in 1977 was \$6.6 billion or about 4.5 percent of the value of all U.S. imports. In terms of roundwood equivalent, about a fifth of our apparent consumption of timber products has been imported in most recent years.

The United States is also a major timber products exporter. In 1977, the total value of timber product exports was about \$4.7 billion—some 4 percent of our exports. Although we ship a variety of wood products to many countries, our principal export markets are Japan for softwood logs and lumber, pulp chips, woodpulp, and paper and board products, and Western Europe for woodpulp, paper and board products, and smaller amounts of lumber and plywood.

International demand for many U.S. timber products, which had been slowly rising since economic conditions in our major overseas markets began to improve in 1975, turned down somewhat in 1978. Current estimates are for continued slow markets for the remainder of 1978 in most European countries with some improvement possible in 1979. The Japanese economy, including housing construction, should also improve next year if current efforts to stimulate the economy and increase housing starts are successful.

SOFTWOOD LUMBER

In response to the leveling off in the housing market and a rise in imports, softwood lumber production in the first half of the year remained close to year-earlier levels. For example, data published by the National Forest Products Association show that output through August was about 1 percent below production in the similar period in 1977. Current expectations about housing and other markets in the final quarter of 1978 indicate that production will likely not rise appreciably in the last half and should total about 31 billion board feet for the year, just slightly under the 31.2 billion board feet produced in 1977 (table 1).

TABLE 1.—WOOD PRODUCTS PRODUCTION, CONSUMPTION, AND TRADE (1975, 1976, AND 1977 ACTUAL, 1978 AND 1979 PROJECTIONS)

Product and year	Domestic production	Imports	Exports	Apparent consumption
Softwood lumber (billion board feet):				
1975.....	26.7	5.7	1.4	31.1
1976.....	29.9	8.0	1.6	36.2
1977.....	31.2	10.4	1.4	40.2
1978.....	31.0	11.2	1.3	40.9
1979.....	29.8	10.3	1.4	38.7
Hardwood lumber (billion board feet):				
1975.....	5.9	.2	.2	5.9
1976.....	6.4	.3	.2	6.5
1977.....	6.6	.3	.3	6.7
1978.....	6.9	.3	.3	6.9
1979.....	6.7	.3	.3	6.7
Softwood plywood (billion square feet, $\frac{3}{8}$ -inch basis):				
1975.....	15.7	(1)	.8	14.9
1976.....	17.8	(1)	.7	17.1
1977.....	18.5	(1)	.3	18.2
1978.....	18.7	(1)	.2	18.5
1979.....	18.2	(1)	.2	18.0
Hardwood plywood (billion square feet, $\frac{3}{8}$ -inch basis):				
1975.....	1.2	1.9	.1	3.1
1976.....	1.3	2.4	.1	3.6
1977.....	1.4	2.3	.1	3.6
1978.....	1.5	2.5	.1	3.9
1979.....	1.4	2.4	.1	3.7
Particleboard ² (billion square feet, $\frac{3}{4}$ -inch basis):				
1975.....	2.6	(1)	.1	2.5
1976.....	3.5	(1)	.1	3.2
1977.....	4.0	.1	.1	4.0
1978.....	4.3	.1	(1)	4.4
1979.....	3.8	.1	.1	3.8
Hardboard (million tons):				
1975.....	1.8	.1	.1	1.8
1976.....	2.1	.2	.1	2.3
1977.....	2.3	.2	.1	2.4
1978.....	2.3	.3	(3)	2.6
1979.....	2.3	.4	.1	2.5
Insulation board (million tons):				
1975.....	1.2	(3)	(3)	1.2
1976.....	1.4	(3)	(3)	1.4
1977.....	1.4	(3)	(3)	1.4
1978.....	1.4	(3)	(3)	1.4
1979.....	1.2	(3)	(3)	1.2
Pulpwood (million cords):				
1975.....	68.9	.7	2.5	67.1
1976.....	77.1	1.0	3.0	75.2
1977.....	80.4	1.2	3.1	78.5
1978.....	82.5	1.8	2.9	81.4
1979.....	83.6	1.9	3.0	82.5

¹ Less than 50,000,000.² Includes medium density fiberboard.³ Less than 50,000.

Note: The projections presented for 1978 and 1979 are based on the trends in the major markets discussed in this paper and should not be viewed as forecasts of actual volumes. Data presented are subject to rounding.

Data from the first 8 months of the year indicate that softwood lumber imports are likely to rise sharply to about 11.2 billion board feet in 1978, 8 percent above the previous record level of 10.4 billion imported in 1977. As has been true in recent years, nearly all of this will come from Canada. Presumably as a result of continued slow construction activity in many countries, exports dropped in the first half, and are expected to total about 1.3 billion board feet, 7 percent below the volume exported in 1977.

Based on the estimates of production, imports, and exports discussed above, apparent consumption (that is production plus imports minus exports) is estimated at 40.9 million board feet—about 2 percent above 1977 and also a record volume. Much of this rise is attributable to increased use in nonresidential construction and maintenance and repair markets. If housing construction drops as outlined above, and

the other major markets perform as discussed earlier, consumption is likely to decline somewhat in 1979. Production and imports are also expected to drop.

Primarily because of the record level of demand, softwood lumber prices have increased steadily in 1978. By September, the producer price index for all softwood lumber was 355.6 (1967=100) (table 2). This was about 10 percent higher than the index in January and about a fifth above the average for 1977. Some slowing in the prices for many items is likely if demand drops in the months ahead as outlined above.

HARDWOOD LUMBER

Although there have been month-to-month fluctuations, production of hardwood lumber has been trending up during 1978 in response to rising demand in its major markets. Output through the first 8 months of the year was 8 percent above the January–August period in 1977, with some further increase likely as furniture and the other industrial markets continue to improve. Production is, therefore, expected to total 6.9 billion board feet for all of 1978, 5 percent more than in 1977.

As was true for softwoods, hardwood lumber imports grew during the first half of 1978, however, the rate of growth and volumes involved were much smaller. As a result the total for this year is estimated at 0.3 billion board feet, the same as in 1977. First half data also show exports above year-earlier levels. However, the volume is also relatively small and is expected to be near the 0.3 billion board feet shipped in 1977.

TABLE 2.—PRODUCER PRICE INDEXES FOR SELECTED WOOD PRODUCTS (1967=100)

Product	1976 annual	1977 annual	September	
			1977	1978
Softwood lumber.....	248.1	297.4	328.3	355.6
Hardwood lumber.....	176.0	200.3	205.9	245.2
Softwood plywood.....	247.4	295.8	332.8	327.8
Hardwood plywood.....	122.5	127.7	129.8	142.9
Particleboard ¹	97.4	113.5	127.0	155.1
Hardboard ²	131.4	142.7	143.1	158.8
Insulation board.....	161.0	177.9	185.2	208.6

¹ Corestock.

² Type II, ½-inch

Source: U.S. Department of Labor, Bureau of Labor Statistics.

Apparent consumption of hardwood lumber in 1978, based on the estimates of production and trade given above, should amount to about 6.9 billion board feet, 3 percent above 1977. If the hardwood lumber markets behave as pointed out earlier, a slight decline in demand in 1979 is probable.

Hardwood lumber prices, as measured by the producer price index, have also been increasing relatively rapidly in 1978, probably in response to the increases in demand outlined above. Prices in September were about 15 percent above January, slightly larger than the increase for softwood lumber. If demand drops as discussed earlier, prices may well show some leveling late this year and in 1979.

SOFTWOOD PLYWOOD

According to data published by the American Plywood Association, total production of softwood plywood in the first 7 months of 1978 was 11.6 billion square feet ($\frac{3}{8}$ -inch basis). This is 1 percent above production in the comparable period in 1977. Based on the likelihood of continued current trends in the major markets in the last months of the year, softwood plywood production for 1978 is estimated at 18.7 billion square feet, up slightly from 1977 and a record level of output.

Softwood plywood exports, which have been slowly rising in the early 1970's, are down somewhat in 1978 and are expected to total only about 0.2 billion square feet, less than a third of the volume in 1975. Imports will remain relatively insignificant.

Apparent consumption in 1978 is therefore estimated at 18.5 billion square feet, also a record. The increase in 1978 is primarily due to rising consumption in maintenance and improvements, nonresidential construction, and in several important manufacturing uses. These markets are expected to partially offset declines in housing use in 1979. The producer price index indicates that in contrast to softwood lumber, softwood plywood prices in 1978 have fluctuated somewhat, but shown relatively little change. For example, the index for September was 327.8 (1967=100), only 1 percent above January and 11 percent over the average for 1977. Some decline is probable if demand slows in the weeks ahead and in 1979, as discussed above.

HARDWOOD PLYWOOD

Hardwood plywood production has been rising since 1975, and in response to the continuing strength of housing and the increase in the production of furniture and other manufactured goods, production in 1978 is expected to total about 1.5 billion square feet ($\frac{3}{8}$ -inch basis), some 7 percent above 1977.

Data for the first half of 1978 indicate that imports are likely to total about 2.5 billion square feet, up some 9 percent from 1977. Exports are expected to remain relatively insignificant.

Given these trends in production and trade, apparent consumption of hardwood plywood in 1978 is estimated at 3.9 billion square feet, up 8 percent from 1977. Some slight decline in consumption is probable in 1979 if the various hardwood markets continue the trends discussed earlier. As in most recent years, over three-fifths of total consumption will likely be supplied from imports.

Hardwood plywood prices, historically much less volatile than those for softwood plywood, have exhibited a small increase in the first 9 months of this year. In September the producer price index was 142.9, about 12 percent above the average for 1977, but only 7 percent larger than the index in October 1974. The relative wholesale price index for hardwood plywood (a measure of its price relative to all wholesale commodities) was 67.3 (1967=100), very probably near the all-time low. Some leveling in prices can be expected in 1979 of the major markets as expected.

PARTICLEBOARD

Particleboard production (including medium density fiberboard) in 1978 is expected to be up about 7 percent to 4.3 billion square feet

(¾-inch basis). Data for the first half of the year suggest that imports are likely to rise slightly but remain at about 0.1 billion square feet and that exports will be about half as large. Consumption is thus estimated at 4.4 billion square feet, 10 percent above 1977. These increases are somewhat smaller than in 1977 and are primarily a reflection of the situation in housing—the market for large volumes of particleboard used for underlayment under carpeting and for subflooring in mobile homes. The expected drop in housing construction in 1979 should cause a small decline in that end-use sector. However, continued growth in manufacturing and the other construction sectors should offset the loss somewhat and only a small decline in production and consumption is likely.

HARDBOARD AND INSULATION BOARD

Hardboard production in 1978 is estimated at about 2.3 million tons (about 6.5 million square feet, ¾-inch basis), about the same as in 1977. Imports are expected to total 0.3 up somewhat from the 1977 volume. Exports will likely be very small. Consumption with these estimates of production and trade would amount to 2.6 million tons (approximately 7.4 billion square feet), up about 6 percent.

Data for the first half of 1978 indicate that insulation board production for the year will total about 1.4 million tons (3.3 billion square feet, ½-inch basis)—the same as in 1977. Imports and exports are expected to be under 0.1 million tons. Therefore, consumption is estimated at 1.4 million tons, also the same as last year and in 1976.

If housing and manufacturing output follow the trends outlined earlier, the demand for hardboard and insulation board will probably show some decline.

PULPWOOD

According to data from the American Paper Institute, production of paper and paperboard in the first 8 months of 1978 was at an annual rate of about 64.1 million tons, 3.6 percent above production in 1977 and very near the historic high reached in 1973. As a consequence, production of woodpulp—which currently constitutes about 77 percent of the raw materials consumed in U.S. paper and board mills—also rose to record levels, as did the pulpwood used for its production. Although industry data indicate that paper and board production has shown some recent fluctuation, woodpulp and pulpwood production are likely to continue at relatively high levels for the remainder of the year. Based on these factors, pulpwood production (roundwood and chips) for 1978 is estimated at 82.5 million cords, 3 percent above 1977 and a new record volume slightly above the previous high reached in 1974.

Imports of pulpwood are expected to total about 1.8 million cords and exports approximately 2.9 million. These volumes are, respectively, 46 percent above and 7 percent below 1977. The sharp increase in imports reflects a large rise in chip imports, principally from Canada.

Pulpwood consumption in 1978, given the above estimates of production and trade, amounts to 81.4 million cords, almost 4 percent more than in 1977. Prospective increases in economic activity and some additional rise in manufacturing suggest that upward trends in pulpwood production and consumption, will continue in 1979.

SOFTWOOD LOGS

Softwood log exports through the first three quarters of 1978 amounted to about 2.5 billion board feet, the bulk of these shipments moving from the Pacific coast States of Washington and Oregon to Japan. Reports from Japan on plans to stimulate the economy, including an increase in housing, indicate that exports may continue above 1977 volumes in the remaining months of 1978. Exports for the year have, therefore, been estimated at 3.3 billion board feet, 9 percent above shipments in 1977 and quite possibly a new record level. A further increase in 1979 is possible. Imports of softwood logs have decreased somewhat and are expected to total 0.1 billion board feet in 1978.

HARDWOOD LOGS

Hardwood log exports in 1978 are estimated at 0.1 billion board feet, about the same as in 1977. Although the volume is relatively small, many of the logs are walnut, high quality oak, and other preferred species that are in short supply in the United States. Thus, exports have been an important contributing factor to the large increases in stumpage and log prices for these species. Hardwood log imports have been dropping rather steadily since the midfifties and are expected to total only 10 million to 15 million board feet in 1978. There will probably be little change in imports or exports in 1979.

SUMMARY

Given the trends in consumption, trade, and production for the various products discussed earlier, U.S. production of industrial roundwood products (that is, the round timber equivalent of all products except fuelwood) is expected to rise to about 11.5 billion cubic feet in 1978. At this level, output would be about 1 percent above 1977 and near the record volume produced in 1973.

Total imports, including the pulpwood equivalent of pulp, paper, and board are likely to increase to about 3.5 billion cubic feet, 12 percent more than in 1977. Exports, on the other hand, are expected to remain at about the level of last year.

With these volumes of production and trade, total apparent consumption of industrial roundwood will be 13.5 billion cubic feet, also near 1973's record. Some decline in consumption, imports, and production can be expected in 1979 if the various markets, particularly housing, behave as discussed earlier. A small rise in exports is likely if the economies of our major trading partners continue to improve in the months ahead.

OUTLOOK FOR DAIRY

(By Charles N. Shaw and James J. Miller, Agricultural Economists, Economics, Statistics, and Cooperatives Service, USDA)

The year of 1978 has shown that dairy surpluses can decline almost as rapidly as they were built up. Only a slight downward readjustment in milk output and a stronger-than-expected rise in commercial use reversed the dairy situation from one of heavy USDA purchases to one of rapidly rising dairy prices. While a great many factors can change the eventual outcome, it appears likely that supplies in 1979 will be fairly well in balance with utilization.

MILK PRODUCTION CONTINUES LOWER

Milk production has remained below year-earlier levels since March and likely will total about 122 billion pounds for the year—down around 1 percent from 1977. Sharp increases in the preceding 2 years apparently represented an overreaction to improved profitability, resulting in a slight downward readjustment this year.

Output per cow has held fairly close to year-earlier levels since late winter—even though milk-feed price relationships have consistently topped last year's favorable readings. During the first three-fourths of this year, output per cow was up less than a half percent, failing to offset the somewhat sharper decline in cow numbers.

Declines in milk cow numbers from a year earlier have been remarkably unvarying thus far in 1978—ranging only from 1 percent to 1.2 percent. However, this was the largest sustained decline since early 1974. Higher cull cow prices and improved off-farm employment opportunities probably were important factors in the larger declines, although continued large numbers of replacement heifers moderated these forces.

Milk production in July–September was about 1 percent below a year earlier, following a smaller drop during the first half of the year. On a regional basis, production during 1978 has registered declines in all regions except the Pacific and mountain regions, where production was up only slightly, and in the Northeast, where production gains have been somewhat stronger.

Farmers reportedly fed about 2 percent more concentrates on October 1 this year than in 1977. Dairy ration costs, while still moderate in October, were well above the very low levels of a year earlier and likely will average slightly higher during the barn feeding season. However, expected higher milk prices probably will keep milk-feed price relationships quite favorable through at least mid-1979. The milk-feed price ratio (pounds of concentrate ration equal in value to 1 pound of milk) stood at 1.84 in October, up substantially from a year earlier and almost a record. Hay prices were lower than last year and supplies are more plentiful.

MILK PRODUCTION ABOUT UNCHANGED IN 1979

Milk production probably will be close to year-earlier levels by early 1979. Favorable milk-feed price relationships could stimulate heavier concentrate feeding and a resumption of sizable increases in output per cow. However, pressures for substantial declines in milk cow numbers will remain strong. Slaughter cow prices probably will stay high and economic alternatives for dairymen could be relatively good.

Milk production later in 1979 will depend on the impact of 1979 crop conditions on feed prices, the rate of increase in other production costs, the impact of demand conditions on milk prices, and other factors. All considered, milk production in 1979 is expected to total slightly more than, or about the same as, the 1978 figure of about 122 billion pounds. The chance of a substantial increase probably is greater than the chance of a substantial decline.

PRICE STRENGTH TO CARRY INTO 1979

After almost 2 years when the support price was the primary factor affecting farm milk prices, the combination of lower milk output, sharp gains in commercial use, and low commercial stocks brought prices up rapidly last summer. Farmers received an average \$11.20 per 100 pounds of milk in October, up more than a tenth from both a year earlier and the June seasonal low. Manufacturing grade milk prices (adjusted for fat test) in October were about 20 cents above the new support price. With the expected seasonal rises in November-December 1978 farm milk prices probably will average about 8 percent higher than 1977. These higher prices likely will push cash receipts from dairying past \$12½ billion, up about 7 percent from 1977 despite slightly smaller marketings.

In early 1979, milk prices will ease seasonally but the expected very low commercial stocks at the start of the year may keep prices above the support level until well into the seasonal upswing in milk production.

If 1979 milk output and commercial use develop as expected, purchases under the price support program could be fairly small and manufacturing grade milk prices could average somewhat above the support price. Farm prices of all milk probably will average 6 to 10 percent higher than in 1978, with the largest gains during the first half. A substantial year-to-year rise is assured by the higher support prices (which must be adjusted on April 1) but potential further increases will be limited by large USDA stocks of butter and nonfat dry milk purchased prior to the summer of 1978. With the expected higher milk prices, increases in dairymen's returns over concentrate costs probably will outstrip rises in other costs.

By late October, wholesale American cheese prices had risen about 13 cents per pound since spring, while butter prices were up about 11 cents. Nonfat dry milk prices were slightly above the support purchase price and had risen almost 4 cents per pound since spring. Some further increases are possible in coming weeks but wholesale prices will be very sensitive to changes in the supply-demand balance until next spring.

Retail dairy prices rose throughout the first three quarters of 1978, but the increase from a year earlier generally has been considerably smaller than the average rise in all food prices. For all of 1978, retail

dairy prices probably will average 6 or 7 percent higher than 1977, with the largest increases occurring this fall. Prices of milk and dairy products in grocery stores could rise 6 to 8 percent next year.

GROWTH IN COMMERCIAL USE TO SLOW IN 1979

Higher consumer incomes and rising prices for other foods have helped to boost demand for dairy products this year. Combined with retail dairy prices only moderately above a year earlier, this strong demand resulted in a more than 3-percent rise in total commercial use during January–September. Butter sales have about matched the fairly good levels of 2 years ago and were up about a tenth from last year. Cheese sales were about 8 percent larger than 1977 during the first 9 months of the year. Ice cream use was slightly larger than last year. However, fluid milk sales and cottage cheese use were about the same as the prior year and commercial disappearance of nonfat dry milk was down slightly. Total commercial use during the last quarter of 1978 probably will be close to a year ago—when the current expansion in demand started. Sales of dairy products next year probably will be just slightly above the more than 119 billion pounds expected in 1978. Retail dairy prices could post the largest rise since 1976. In addition, a pattern has been established in recent years of little or no gain in sales following a year of sharp expansion.

Per capita civilian consumption of milkfat in 1978 probably will be up almost 2 percent from last year and the largest in 6 years. Per person use of milk solids-not-fat likely will rise almost 1 percent, attaining the highest level since 1973. Next year, per capita use of milkfat might be down just slightly but the use of solids-not-fat could rise slightly. Changes during 1977–79 will reflect shifts in the commercial market since domestic donations from USDA supplies probably will be similar in all 3 years.

COMMERCIAL DAIRY STOCKS LOW

Commercial stocks of dairy products have been at relatively low levels since early 1978. Industry holdings in the first half of 1978 were kept down in anticipation of a heavy surplus in late spring and early summer (which did not really materialize). Since then, lower milk output and larger commercial use have kept commercial stocks tight and October 1 holdings of both milkfat and solids-not-fat were down about 13 percent from a year earlier. Stocks of American cheese were in the tightest position but commercial holdings of butter and nonfat dry milk were also down substantially. If commercial use holds as anticipated this fall, commercial dairy stocks will be very low at the start of 1979. On the other hand, USDA stocks of butter and nonfat dry milk remain quite large; the October 1 holdings represented about 2 years' donation usage at current rates.

USDA PURCHASES DROP

USDA purchases under the price support program dropped dramatically this summer as market conditions tightened. About 12 million pounds of butter were sold back to the industry in August-September. Through October, CCC net removals totaled 122 million pounds of butter and about 49 million pounds of cheese, for a milk equivalent total of 2.9 billion pounds, down a half from a year earlier. Proportionately more nonfat dry milk than butter was purchased but the 277 million pounds were a third less than the same period of 1977. While the 1978 purchases of dairy products have been moderate, they have not given opportunity to significantly reduce the large Government stocks. Purchases in 1979 could be somewhat smaller than this year if milk output and commercial use are as expected.

CHEESE IMPORTS UP SOMEWHAT

The strong cheese demand resulted in somewhat larger imports of cheese during January-September. Imports of other dairy products were also slightly larger than a year earlier. During the first 9 months of 1978, imports were equivalent to about 1.4 billion pounds of milk, up about a tenth from a year ago.

Commercial exports this year continued to slip from last year's small level. U.S. dairy products are high-priced relative to products from Oceania or heavily subsidized European products. On the other hand, food aid exports of nonfat dry milk during the first three quarters of 1978 were considerably larger than the previous year.

In general, those countries outside of the EC with supported dairy economies have done a fair job of bringing surpluses under control. This has eased downward pressure on prices of dairy products in international trade. However, no longrun solution can occur until the structural imbalance in the EC is corrected.

SUMMARY

Next year probably will see slightly higher milk production and slightly higher commercial use. However, the low commercial stocks at the start of 1979 will provide moderate strength in prices and USDA purchases could be smaller. While a great many factors could upset this delicate balance, next year probably will be another fairly good year for dairymen.

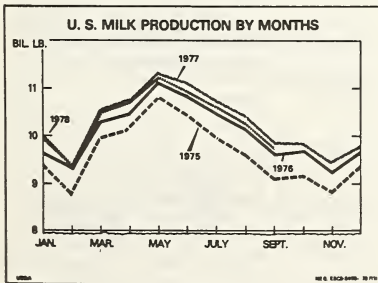


FIGURE 1

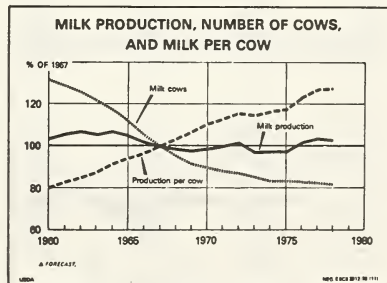


FIGURE 2

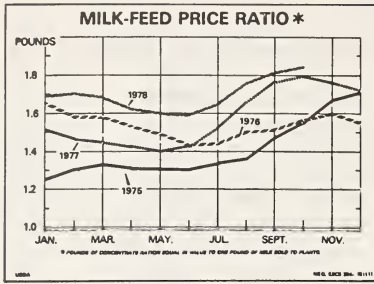


FIGURE 3

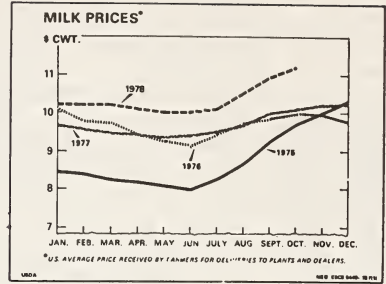


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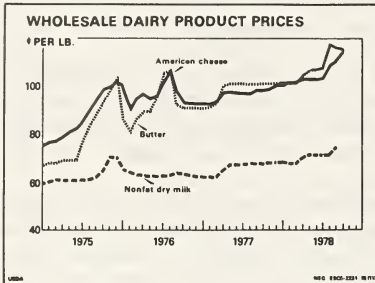


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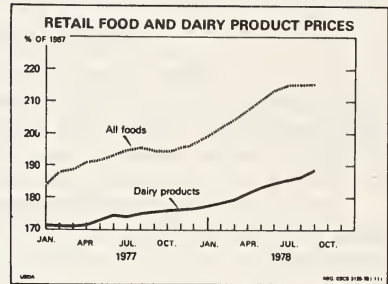


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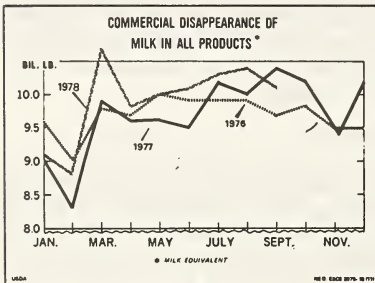


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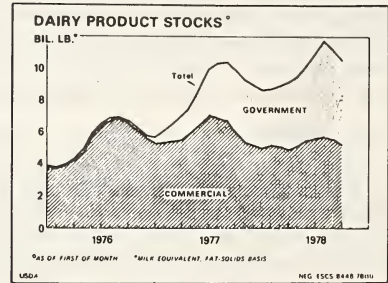


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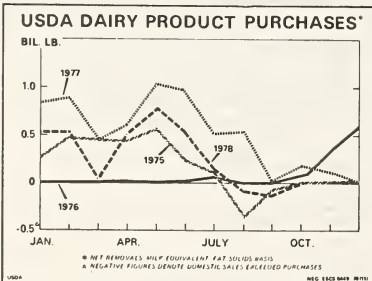


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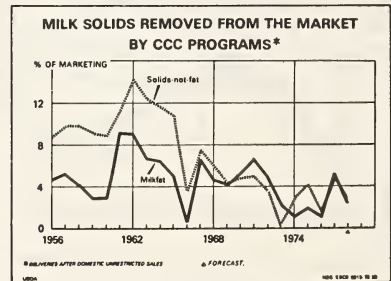


FIGURE 10

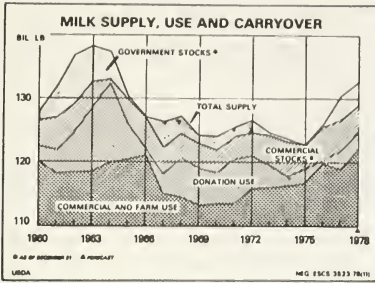


FIGURE 11

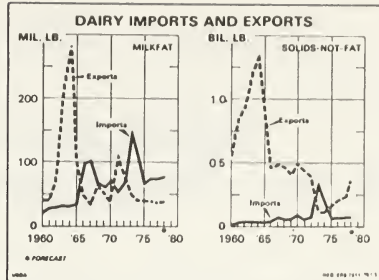


FIGURE 12

TABLE 1.—DAIRY SUMMARY, 1976-78

Item and unit	1976	1977	1978	Percent change 1977-78
ANNUAL¹				
Milk production (billion pounds).....	120.3	123.0	122.0	-0.8
Milk per cow (pounds).....	10,879	11,194	11,230	+3
Number of cows (thousands).....	11,055	10,984	10,865	-1.1
Milk prices received by farmers (dollars per hundredweight).....	9.66	9.72	10.55	+8.5
Manufacturing grade (dollars per hundredweight).....	8.57	8.71	9.60	+10.2
Cash receipts (million dollars).....	11,428	11,776	12,700	+7.8
Value of dairy rations (dollars per hundredweight).....	6.31	6.21	6.10	-1.8
Milk-feed price ratio (pounds).....	1.53	1.57	1.73	+10.2
Utility cow prices, Omaha (dollars per hundredweight).....	25.31	25.32	36.75	+45.1
JANUARY-OCTOBER				
Wholesale prices:				
Butter (Chicago, grade A) (cents per pound).....	92.3	97.9	107.7	+10.0
American cheese (Wisconsin assembling points, 40-lb. blocks) (cents per pound).....	97.0	96.3	104.8	+8.8
Nonfat dry milk (manufacturers' average) ² (cents per pound).....	63.5	66.0	70.2	+6.4
Dairy products (BLS) (1967=100).....	168.5	172.6	185.8	+7.6
USDA net removals:				
Butter (million pounds).....	5.2	216.3	122.1	-43.6
American cheese (million pounds).....	11.3	147.7	39.7	-73.1
Nonfat dry milk (million pounds).....	120.1	419.4	276.7	-34.0
Evaporated milk (million pounds).....	18.9	13.4	14.8	+10.4
Milk equivalent (million pounds).....	261	5,955	2,946	-50.5
JANUARY-SEPTEMBER				
Retail prices (BLS):				
All foods (1967=100).....	180.6	191.1	209.2	+9.5
Dairy products (1967=100).....	168.4	173.0	182.9	+5.7
Manufactured products output:				
Butter (million pounds).....	730.5	830.0	784.0	-5.5
American cheese (million pounds).....	1,584.4	1,600.6	1,609.2	+0.5
Other cheese (million pounds).....	945.7	971.2	1,051.5	+8.3
Nonfat dry milk (million pounds).....	742.1	892.6	782.6	-12.3
Canned milk (million pounds).....	754.7	659.5	606.6	-8.0
Cottage cheese (million pounds).....	673.9	675.4	673.9	-0.2
Ice cream (million gallons).....	646.3	634.9	641.2	+1.0
Ice milk (million gallons).....	234.2	240.0	238.3	-0.7
Imports of dairy products: Total milk equivalent (million pounds).....	1,218	1,281	1,424	+11.2
Commercial disappearance:				
Total milk (million pounds).....	87,607	86,547	89,385	+3.3
Butter (million pounds).....	672.2	608.3	669.8	+10.1
American cheese (million pounds).....	1,425.7	1,433.4	1,561.7	+9.0
Other cheese (million pounds).....	1,062.4	1,093.9	1,176.2	+7.5
Canned milk (million pounds).....	661.0	570.6	533.8	-6.4
Nonfat dry milk (million pounds).....	571.2	515.9	512.7	-0.6
Cottage cheese (million pounds).....	673.9	675.4	673.9	-0.2
Ice cream (million gallons).....	646.3	634.9	641.2	+1.0
Ice milk (million gallons).....	234.2	240.0	238.3	-0.7
Average daily sales in urban markets:				
Fluid whole milk.....				-2.2
Fluid low-fat milk.....				+4.6
Cream and cream mixtures ³				-2.6
Total fluid products.....				+3

¹ 1978 estimated. ² January-September. ³ January-August.

OUTLOOK FOR POULTRY AND EGGS

(By William E. Cathcart, Agricultural Economist, Economics, Statistics, and Cooperatives Service, USDA)

Broiler and turkey producers had a good year in 1978 and prospects point to continued favorable conditions in 1979. Producers will respond by increasing output above the record 1978 broiler and turkey output. Egg producers' profits dropped from 1977 levels during the first three quarters of 1978 but are improving this fall. Their returns will continue to improve in 1979 if output shows little expansion as expected.

Even with the moderate expansion in broiler production in 1978, producers have been able to make good profits. Feed prices have been below 1977 much of this year. Growth in consumer incomes and sharp increases in red meat prices pushed poultry prices above last year. Before discussing the outlook for poultry and eggs in more detail a few comments about feed costs and supplies of competing meat supplies will help put the outlook in perspective.

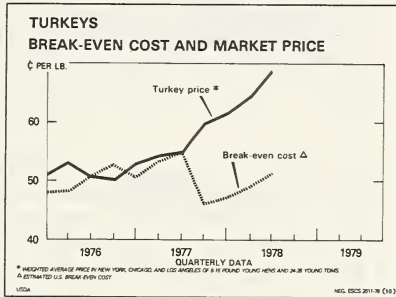
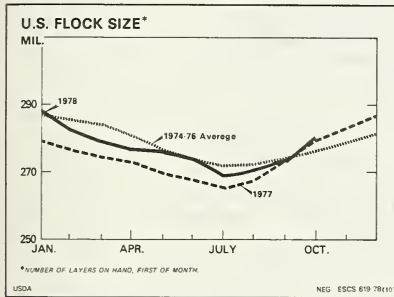
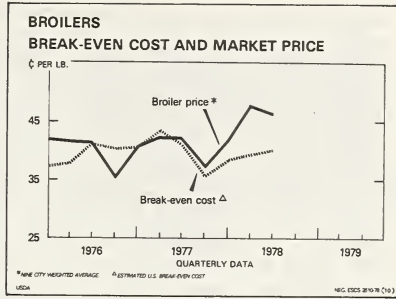
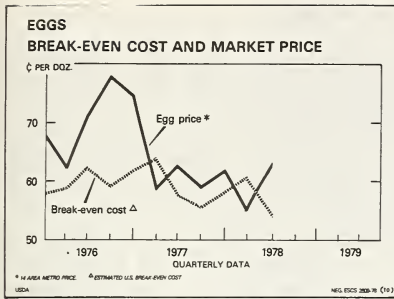
Feed costs in 1978 increased from late 1977 levels but remained below year-earlier levels until recent months. Corn prices moved upward through the spring before weakening. This summer, however, corn prices at the farm averaged 30 cents a bushel above the low levels of July-September 1977. Soybean meal prices also moved upward through the spring but were well below the high levels of a year earlier. They weakened this summer but moved above summer 1977 levels.

This year's corn crop on October 1 was estimated to total around a record 6.8 billion bushels, 7 percent more than last year. With carryover stocks at a billion bushels, supplies will be a record 7.8 billion bushels. Corn prices at the farm may average around \$1.95 to \$2.15 in the 1978-79 crop year, compared with \$2.03 in 1977-78.

Another large soybean crop is expected. On October 1 the crop was estimated at nearly 1.8 billion bushels, 2 percent above 1977-78. Combined with a carryover of 159 million bushels, the estimated supply would be nearly 5 percent above a year earlier. However, strong domestic and world demand is expected to result in higher prices. Soybean meal prices are currently running well above year-earlier levels and are expected to remain so during most of 1979.

Thus, feed costs for poultry and eggs are above a year earlier this fall and will show an increase from 1978 levels during most of 1979. Production costs other than feed will continue to rise. However, favorable general economic conditions and competing meat supplies will result in favorable producers' returns.

Continued growth in consumers' incomes is expected, although the real growth rate may slow. Poultry and egg demand will be bolstered by the continued growth in real income.

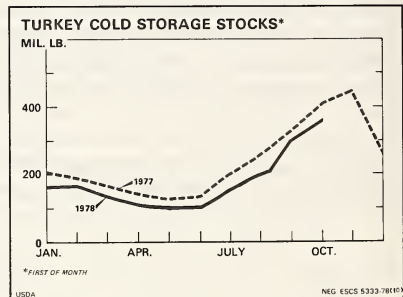
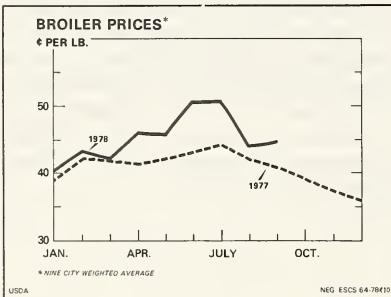
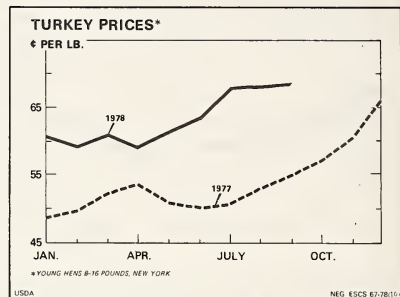
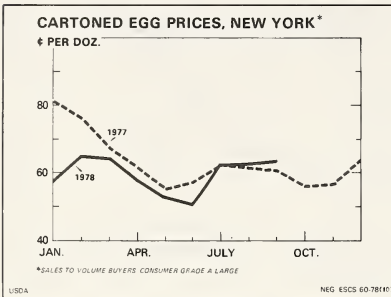


A year ago, indications pointed to larger red meat supplies in 1978 than in 1977. However, the gains in pork output did not materialize and total red meat supplies lagged as reduced beef supplies offset a small increase in pork output. Beef supplies in 1979 will continue to drop as reduced nonfed beef output offsets higher fed beef production. The extent of the drop in total beef production will be dictated by producers' decisions on rebuilding of the cattle herd but the decline could be a little greater than the 4 percent reduction in 1978. Pork production is expected to increase moderately in 1979.

THE OUTLOOK FOR EGGS

Egg production this fall is expected to be near year-earlier levels but may pick up a little in early 1979. However, more of the eggs produced will go for hatchery purposes and result in higher prices than in 1978.

Output for all of 1978 will total around 2 percent above the previous year. This year's gain in output was due to both a larger laying flock and a higher rate of lay. Egg production was up 5 percent in January this year but tapered off to 2 percent higher in September. The 5-percent gain in January was caused by about a 2½-percent increase in both layer numbers and output per hen, whereas all of the September gain resulted from higher output per hen. The drop in layer numbers relative to a year ago was caused by reduced replacement pullets.



Layer numbers on October 1 and egg-type pullets for flock replacements during the balance of 1978 are about the same as a year earlier. The rate of lay will slip closer to 1977 levels in coming months. Thus, egg output during the remainder of 1978 will be near a year ago.

Layer numbers may pick up in early 1979 and average slightly above 1978 largely because of a substantial increase in the broiler hatchery supply flock. Egg-type chicks hatched during July–September this year suggest that replacement pullets for the first quarter of 1979 will about equal a year earlier. Flock numbers may also get a boost from reduced culling of mature hens from the relatively high rates in January–March 1978.

The rate of lay will likely continue up, but an older flock should keep the gain well below the 2-percent increase registered in the first quarter of 1978. Total egg production during the first quarter of 1979 will likely be up from this year, perhaps around 1 percent.

There will likely be a few more replacement pullets than a year earlier next spring. However, producers are expected to be in a loss situation and the additional pullets likely will be largely offset by heavier cullings of old hens.

Laying flock numbers after mid-1979 will largely depend on profitability during the first half when producers will make decisions about the number of pullets to produce for second half flock replacements. Favorable profits in January–March would likely lead to increased hatch of egg-type chicks. This could push the laying flock size to a little above 1978 levels next summer.

Prices during the first half of 1978 for cartoned grade A large eggs in New York averaged 58 cents a dozen, about 8 cents below a year earlier. The lower price was largely due to a 3½-percent increase in output. However, as output slipped back closer to 1977 levels, prices rose during the summer and, at 63 cents a dozen, averaged nearly 2 cents above July–September 1977. Prices likely will show some further increase this fall and continue strong in early 1979 before declining as usual next spring. Prices during October–December are expected to average in the mid-60's compared to 59 cents last fall. If output increases are small in early 1979 as expected, first quarter egg prices will remain above year-earlier levels and likely average in the low-to-mid-60's. Prices may weaken seasonally to the upper 50's next spring and below their cost of production and marketing. If producers hold layer numbers to only a small increase in the second half of 1979, prices next summer could about match the 63 cents a dozen for July–September 1978.

OUTLOOK FOR BROILERS

Broiler producers are looking for another good year in 1979. Output will be up as producers respond to good profits in 1978 and favorable 1979 prospects. However, 1979 broiler prices may average near 1978 levels.

Output of broiler meat in 1978 will total around 10-billion pounds (ready-to-cook weight), 7 percent above 1977 and almost 25-percent higher than in 1975. Federally inspected slaughter has been above the same month a year earlier since August 1975, with the exception of July 1977. Producers have continued to expand because most have made a profit every quarter except two since 1974.

Broiler meat production through federally inspected plants in January–September was 6½ percent above a year earlier. The number of broilers slaughtered was up around 5 percent while average slaughter weights gained 1½ percent. After being up 8 percent in the first quarter of 1978, spring and summer output was only 6 percent above. The smaller increase in the spring was due to limited availability of hatching eggs earlier in the year. Summer output was limited by one less slaughter day and hatchability problems. Hatchability problems will also hamper fall production increases, but October–December broiler output should be 7 to 9 percent above a year earlier.

Hatchability (the ratio of the number of chicks placed to the number of eggs set in incubators) was much less than usual this summer. Broiler chicks placed in 21 major broiler producing States from July 8 to September 30 totaled 899 million. Eggs set in incubators 3 weeks earlier totaled 1,156 million eggs. Dividing the number of chicks hatched by the number of eggs set gives a hatchability ratio of 77.8 percent. The ratio during the comparable weeks in 1977 was 80 percent and 81.6 percent in 1976. However, there were several weeks this summer that the ratio showed a much larger drop from 1977 levels. The reduced hatchability was likely caused by a combination of disease problems, heat related reduction in fertility, new strains of birds, and use of eggs normally considered too small. The hatchability problem seems to have improved in recent weeks.

All indications point to broiler producers showing a fairly sharp increase in output in the first half of 1979—perhaps 8 to 10 percent. Feed prices will be above January–June 1978 but increased consumer incomes and high red meat prices will bolster the demand for broilers. Unlike early 1978, producers should have enough hatching eggs. Favorable profits have encouraged producers to place more chicks for late 1978 and early 1979 replacement pullets. Cumulative placements 7–14 months earlier indicate the hatchery supply flock will be 11 percent larger than a year earlier this fall and 14 percent larger in the first quarter of 1979. Second half 1979 output will depend on 1979 crop prospects, general economic conditions, and red meat supplies. However, if conditions are favorable, broiler producers may continue to produce 8 to 10 percent more through the end of the year.

Broiler prices this year have been benefited from strong consumer demand for meat and sharply higher red meat prices. The 9-city wholesale broiler price in 1978 will average around 4 cents a pound above the 41-cent average in 1977 even though broiler output will be up around 7 percent. Broiler prices moved steadily upward through July, when they averaged 51 cents per pound. They subsequently weakened to 42 cents in October. However, this was still 3 cents a pound above last October. The 9-city price is expected to average in the low 40's in October–December, compared to 38 cents last fall.

Even though a fairly sharp increase in broiler output is expected in 1979, broiler prices may average near 1978. Broiler prices will be bolstered by increased consumer incomes and lower beef supplies. The 9-city wholesale price during January–March 1979 likely will average around 2 cents above the 42 cents a pound of a year earlier. Prices will strengthen into the summer but may average slightly below this year.

TURKEY OUTLOOK

Turkey producers probably have had one of their best years in history in 1978, and 1979 is expected to be another good year. Output will be up sharply and prices will drop. However, producers are still expected to make profits.

The 1978 turkey crop was estimated by USDA's Crop Reporting Board in September at 141.5 million birds, 3 percent above a year earlier. Heavy breeds were up 7 percent to 133.8 million, while light breeds, at 7.6 million, declined 27 percent. These estimates are based on the number of poults hatched during September 1, 1977 through August 31, 1978.

Turkey meat output in federally inspected plants through September totaled around 1.3 billion pounds (ready-to-cook weight), 5 percent above a year earlier. The number of turkeys marketed was up 2 percent, while the average liveweight rose $2\frac{1}{2}$ percent. The heavier weights reflect the change in the mix of turkeys toward more heavy breeds and fewer light breeds. Output was up 9 percent in the first half but percentage increases have dropped sharply in the second half. Last year, when turkey producers were making plans for 1978, pork production was expected to show a fairly sharp expansion, especially during the second half. Therefore, turkey producers did not plan for a large increase for the second half of 1978. Turkey output in July-September showed only a small increase from year-earlier levels. Output in October-December is expected to be around 4 percent above last fall. However, there is a possibility of considerable variance around the expected 4 percent increase because producers have flexibility in marketing their turkeys.

Turkey cold storage stocks have been drawn down this year even though production has been up and wholesale prices averaged well above a year earlier. Cold storage holdings at the beginning of 1978 were 35 million pounds below a year earlier. The margin narrowed to 29 million pounds below on June 1 but widened to 48 million pounds on October 1. Beginning 1979 stocks will depend on movement of turkeys in the coming holidays, but they will likely be down from a year earlier as much as on January 1, 1978.

Turkey production will show a sharp expansion in 1979, reflecting excellent 1978 profits, lower beginning year turkey stocks, and continued high red meat prices. The hatch of heavy breed poults was up 25 percent in August, September's hatch of all breeds was 23 percent above, and turkey eggs in incubators on October 1 gained 19 percent from a year earlier. Thus, turkey meat production during January-June 1979 is expected to be 20-25 percent above the first half 1978 levels. The percentage increases will narrow in the second half when output increases seasonally.

Turkey prices in 1978 moved upward throughout the year and have been well above year-earlier levels. For the year, turkey prices will average the highest in recent history. Gains in consumer incomes, sharply higher red meat prices, and specializing of turkeys by retailers early in the year has resulted in strong consumer demand for turkey meat this year. Prices for 8 to 16 pound young hens in New York averaged nearly 61 cents a pound in January-June, 10 cents above a

year earlier. Prices moved up to 68 cents in the summer and have continued to gain this fall. Young hen prices will average in the low-to mid-70's during October-December.

Turkey prices in the first half of 1979 will weaken from this fall's levels but stay above a year earlier. The expected 20-25 percent increase in turkey output from a year earlier will weaken turkey prices, but lower beginning year turkey cold storage holdings and continued high red meat prices will limit the declines. Young hen turkeys in New York are expected to average in the low- to mid-60's during January-June 1979 compared with 61 cents a year earlier. Second half turkey prices will likely drop well below the high levels of July-December 1978.

POULTRY AND EGG USE IN 1978

Domestic egg consumption will be up slightly in 1978. This year's use is estimated to be up about 1 egg per person from 1977 to 273 eggs per person. If the estimate materializes, this will be the first year since 1971 that per capita consumption has shown an increase. Egg production this year will be up around 2 percent but increased exports, hatchery use, and population gains, will be largely offsetting.

Combined chicken and turkey use for 1978 is expected to be up around 3 pounds from 1977 record levels to 57 pounds per person. Broiler (young chicken) consumption likely will total around 44.5 pounds compared with 41.7 pounds for 1977. Other chicken use may show a small decline from 1977. Turkey use for 1978 is expected to total around 9.5 pounds per person, up from the record 9.2 pounds for both 1976 and 1977. Chicken and turkey production is expected to show a sharp expansion in 1979 and consumption may be 3 to 4 pounds per person above this year.

POULTRY AND EGGS: INDUSTRY VIEW

(By Lee Campbell, Executive Vice President, Poultry and Egg Institute of America)

As I thought about what I was going to say here today I talked with a number of our industry members, especially those on our board of directors, about what they see as problems or opportunities downstream—or maybe I should say upstream—and I'll talk about some of those things as well as my own observations.

First, I find a general attitude of some optimism. There is agreement that, as Bill Cathcart said, prospects point to favorable conditions in 1979 for poultry as far as price, supply, and demand are concerned. The situation with competing meats is favorable to broilers and turkeys. I get projections of an 8-9 percent increase in the number of turkeys and, under the conditions, that's not a burdensome figure. An increased per capita consumption this year, lowest inventory in years, demand for whole birds and parts good, a cost attractive purchase for consumers. New products gaining acceptance. As one industryman put it, "Turkey is coming into its own."

Broilers, too, are realizing the benefits bestowed by competing meats. I am told that broiler breeders are behind on deliveries so this may cause problems in getting birds. But with those broiler breeders producing 35 million this year—and a 10 percent increase forecast for 1979, some concern is expressed about where is the saturation point.

Cathcart indicated that egg producers' returns should continue to improve in 1979 if output shows little expansion as expected and my discussions with industry bears that out. But concern is expressed to me about the increases in prices of corn, milo, and soybeans in face of abundant harvests. The uncertainty of the world protein situation is important to all our commodity producers. I do see some optimism, though, from egg producers that eggs may be making some winning points in the health scare battle.

Let me now, though, get to some other areas that bear on this industry.

The recent action by the 95th Congress which made poultry raising and feeding facilities eligible for the investment tax credit is most important—a boon to poultry producers—significant in figuring return on investment. It is important, too, in offsetting increased costs of facilities that inhibit growth.

We continue to be optimistic about our opportunities for export of U.S. poultry and eggs. Out exports amounted to \$283 million last year. That set a new record for the sixth consecutive year. The 1977 record included increases in both the poultry meat and egg categories.

When the Poultry and Egg Institute, in cooperation with USDA's Foreign Agricultural Service just began developing markets abroad

through its International Trade Development Board 20 years ago, export sales of U.S. poultry and eggs were virtually nonexistent.

Adverse elements still exist in the international marketing of poultry and eggs. These elements may be limited access to markets or subsidies paid by our competitor countries. U.S. exporters, with the help of PEIA and FAS, however, many times have compensated for import restrictions and subsidies by seeking out and developing new export markets and introducing new products into established markets. That's why we have been able to set records in spite of barriers.

The facts are that when fair access is accorded U.S. poultry and eggs it has been demonstrated that we can compete anywhere in the world.

One factor in broiler exports was the ability of the former National Broiler Marketing Association to bid on large orders. With NBMA no longer in existence something to replace that ability to ship large orders will be forthcoming—a Webb-Pomerene corporation, perhaps.

The poultry and egg industry is watching with anticipation the current multilateral trade negotiations in Geneva. The industry strongly supported the Trade Act which made these negotiations possible. We realize that if ever we are to get meaningful concessions, this is it. And if we do, our marketing efforts in international markets will continue to set records.

A problem outside the MTN rears its ugly head and threatens our remaining exports to the European Community—particularly to West Germany and to the United Kingdom. This is, of course, an EC regulation which becomes effective February 15 and which involves the use of spinchillers. These kinds of regulations are deplorable to us, particularly when everyone knows the kind of inspection system the United States has as compared with other nations and the way inspection systems are enforced.

What are some of the concerns of the poultry and egg industry?

Interest rate outlook. Inflation impact. Transportation and storage capacity. Uncertainty and costliness of regulations. Shortage of labor in processing plants. Legal fees. Capital investment. Wage and price guidelines. Nitrite—and its future. Mechanically deboned poultry meat, and its future. Type of chilling. Open code dating. Quality assurance. Concern about the value of the dollar and its relation to world trade in agriculture. Water usage and environmental problems not only in processing but in grow-out operations and in egg production. Net weight proposals. Productivity. New inspection procedures. Nutrition proposals based on the dietary goals report.

Time doesn't permit elaborating on all of these concerns but let me touch on some of them.

The interest rate outlook is not a concern only of industry. It touches so many. In my discussions with industry, I find many are predicting a 12½ percent rate before it starts down. This is an effective curb on borrowing plans. How much this will discourage future expansion in food and agriculture is difficult to measure.

The administration is committed to a reduction in regulation. When you consider that in 1977 alone, according to research by the Chase Manhattan Bank, Government regulations cost the U.S. consumer \$100 billion, you can appreciate that in our highly regulated industry there are concerns. That \$100 billion, incidentally, equals \$470 for each person living in the United States, 5 percent of the gross national

product, 25 percent of the entire Federal budget, and nearly three-quarters of the annual private investment in plant and equipment, according to Chase Manhattan.

OSHA is repealing 1,100 of its more meaningless rules. But what about the State and Federal environmental controls. I talked with one industry processor whose annual sales volume is \$20 million. That firm is in the process of spending \$3 million to comply with EPA rules now for 1981. That's in addition to what has already been spent by that firm. And when it's all done, by 1981, the capacity of the plant will long ago have been reached—and being unable to reduce water usage (partially because of waste) what is ahead? Expansion is not possible! How do you recoup a \$3 million expenditure on \$20 million sales in a competitive industry like this?

Personnel problems will continue to plague our industry. A shortage of labor in processing plants exists. Government programs, including welfare, do not help. Rates, however, are substantially above the minimum wage. But there are problems with supervisory labor as well. Profit sharing programs get disturbed by the stock market decline. Union organization efforts dominate, more and more, the time of top management.

A particular nutritional emphasis started when a Senate committee issued its dietary goals filled with committee staff predilections. Poultry fared well. It's the best solution for meat diets in the world. It's a good converter of grains. The nutritional emphasis gives it the inside track.

But when it comes to eggs, industry continues to be concerned about those who present speculation as fact. Scientists can not honestly say whether limiting eggs in the diet will help the heart. On the contrary, some recent studies are tending to remove eggs from medical suspicions.

In view of this, we are concerned about a Washington area grocers' campaign to teach "heart" facts at their stores and in particular their statement that eating fewer egg yolks will help your heart.

The campaign is being conducted in cooperation with the Government's National Heart, Lung and Blood Institute. As the National Commission on Egg Nutrition has said, "You would think the Government knows better than to plan its imprimatur on questionable statements of the type involved here." Our industry is concerned about whether this same effort will be repeated across the country by other grocery outlets.

In the coming Congress, we anticipate more action in the whole area of nutrition and labeling. On our part, we will continue to insist that the Department of Agriculture be the lead agency in matters relating to nutrition, that school lunch programs remain in the Department.

This is not because we believe the Department is always right in matters of nutrition and we do find ourselves at times in a persuasive situation with USDA. But we believe that the Department is the proper agency to deal with these matters.

Let me touch on poultry inspection. Budget restraints, employee ceilings, regulatory deemphasis all point to a pressing need to increased productivity on the part of poultry inspection. Inspection procedures must be modernized. The Department is working in this

direction and is to be commended. Perhaps in 1979 we will see real progress in this area—and if it means new or amended legislation to get this accomplished our industry stands ready to assist the Congress and the administration.

One of the bright areas in the poultry industry has been the development of a variety of red meat type products—chicken and turkey hot dogs, turkey ham, chicken and turkey bologna, turkey pastrami, turkey sausage and the like. The possibilities for these items stagger the imagination, especially for turkey. Think what this does to move turkey consumption into the year 'round.

But now that vision is clouded. Nitrite—used in all of these cured products—stands in danger of being, at best, phased out. If ever a food additive was entitled to a risk-benefit assessment, nitrite is the one. How do you balance the inconclusive evidence of a cancer risk with a known risk of botulism and decide that nitrite should be banned? It is not difficult to predict—at this outlook session—that the issue of nitrite will continue to dominate food industry news in 1979.

PRICE OUTLOOK FOR POULTRY AND EGGS

(By Lee F. Schrader, Purdue University)

Bill Cathcart shared a draft of his report with me prior to the conference, and I find myself in rather close agreement with his analyses.

It now appears that 1979 is likely to be a relatively good year for the feather business. Egg prices should keep producers in the black for most of the year. Broiler and turkey prices will probably be a bit lower than last year but above costs for most producers. These prices will keep production expanding during the year ahead. Egg prices are likely to have begun cyclical decrease by the end of 1979. Continued expansion of broiler and turkey production is likely to bring prices for those products near or below full costs of production by early 1980.

It is an unusual year when we can anticipate favorable producer returns with only moderate egg price increase and the probability of somewhat lower broiler and turkey prices for the consumer.

Projecting prices for more than a year ahead is always a difficult task. This year the numbers seem to have fallen into place with a minimum of effort. Not much difference of opinion has been detected among analysts in the poultry and egg area. There are, however, several factors which could change the situation quickly and substantially.

There was a time when one could deal with the poultry meat situation largely in isolation from the red meat sector. But poultry meat has become such a large part of the average diet that the interrelationship must be recognized. The relationship is not close or exact. Ready-to-cook broilers at wholesale selling at a discount to live hogs on a pound basis is evidence that the consumer does not view the products as a direct substitute. I suspect they are moving closer. The point is that the 1979 outlook for broiler and turkey prices are heavily dependent on red meat supplies being below the 1978 level. Clearly it would not be possible to market 10 percent more poultry meat in 1979 without large negative price impact if red meat production were increasing at or near the longer term trend. The cattle herd is being reduced and it will take years to change that picture. But more beef will be forthcoming. Hog production is on the increase and its impact will be felt before the end of 1979. Disease, weather, and, perhaps, a response to low price forecasts kept pork production well below the expected level in 1978. The continuing uncertainty regarding the use of nitrites in cured meat products may have been a factor in the small producer response to attractive price-cost ratios. Could we mislead ourselves in the opposite direction this year? Knowledgeable observers differ on the rate of expansion now in progress.

The poultry and egg outlook reviewed above also depends on the course of the general economy. Many in the poultry business expect poultry and egg sales to hold or increase when consumer income is reduced. The belief is that the economizing consumer should turn

to low-cost protein sources such as poultry and eggs. The statistics do not support that view. It seems that, when the consumer cuts the food budget, eggs and poultry are reduced as well. The 1979 food budget may be in a vulnerable position. Consumers have been borrowing more and saving less. Installment debt and mortgage commitments are large. To an extent this has been a response to rapidly increasing prices—a buy it now before the price increases attitude. As long as incomes increase, this debt load is no problem, but any income decrease will leave a large fixed repayment commitment. As a result, any downward adjustment in income is likely to have a larger than usual impact on food purchases, one of the few flexible items in the budget. I do not expect lower incomes, but I do feel the potential exists for a substantial impact on food product prices if a recession were to come in 1979.

Inflation with consumer income increasing apace does tend to pull food prices along. Other prices increasing make food appear relatively cheaper. Inflation with income constant or increasing at a slower rate than prices results in lower real income which may more than offset the effect of lower relative food prices and cut the demand for food products.

We have been talking about price as if we all know what it is. I want to remind you that all is not well with the process of pricing itself. Egg pricing has been recognized as a problem for many years. Most wish to price product transfers based on the market, but there are few left to "make" the market. Too many of the negotiated trades are made in secret to avoid upsetting the market. Egg Clearinghouse Inc., represents an open market for nest-run eggs but trading there remains small. USDA's Agricultural Marketing Service is sharing the cost of several efforts to increase open market trading including one by ECI through the Georgia Department of Agriculture. This project will take computer trading terminals into the trading firms to expedite trading and information transfer. But no amount of gadgets will substitute for a dedication on the part of the egg trade to give open trading a fair trial.

The broiler and turkey business is following a similar path. Most broiler sales to retailers (or distributors) remain on a weekly negotiated basis with little ice-packed product moved unpriced. But the volume of chicken shipped prepackaged is increasing. These sales tend to be priced on a formula basis against the icepacked quote. The problem is not acute but the trend is quite clear.

We are beginning a study of turkey pricing at Purdue in cooperation with the Department of Agriculture. We don't know the extent of formula pricing of turkey but it is clear that the volume of turkey moving through the marketing channel as plain frozen whole body birds has decreased dramatically during the past several years. Only about 18 percent of the tonnage moved as commodity whole turkey during 1977 and the amount appears to be lower in 1978. The commodity most commonly quoted and used in price analysis work may be decreasing to the point that its price is no longer a reliable indicator of the situation in the rest of the market.

I will be asking the help of at least some of you in the course of the next year. I hope that we will be able to place the problem in sharp perspective and to propose some alternatives to improve the pricing process and price information system.

WHAT DOES IT COST TO PRODUCE TOBACCO?

(By Verner N. Grise, Agricultural Economist, Economics, Statistics, and Cooperatives Service)

When you ask a farmer how much it costs to grow a pound or an acre of tobacco the answer you get may be, "it costs too much," or "more than it did last year," or some other reaction that indicates the overall costs of raising tobacco are rising. When you probe further, you likely will find that cost of production means one thing to one farmer and something else to another. The same can be said about farm policy officials and "even" economists. On the surface, costs of production estimation may seem very simple, but, in fact, is very complex.

The complexities of cost estimation arise when one attempts to place a value on family labor, calculate machinery and barn ownership costs, allocate overhead items that are used jointly by more than one commodity, and charge for land and tobacco quotas. Charges for these items cannot be made in a simple and straightforward manner as with fertilizer where we multiply quantity used times a price that is readily available. Despite the complexities of calculating costs, the demand for current data on production costs for agricultural commodities is increasing. Consequently, it is essential that we provide cost data based on the most up-to-date information and most realistic assumptions possible.

The Agriculture and Consumer Protection Act of 1973 directed the Secretary of Agriculture to estimate the annual cost of producing certain major commodities. Although the cost of producing tobacco was not included in that mandate, the Commodity Economics Division has begun a major effort to develop a comprehensive program to improve its data on cost of production for all major enterprises. In March and April of 1977 ESCS personnel surveyed 790 Burley tobacco producers in five areas of Kentucky and Tennessee. These were the inner, intermediate, and outer Bluegrass areas of Kentucky, counties in south central Kentucky, and north-central Tennessee and eastern Tennessee. The average costs of producing Burley tobacco in the five study areas in 1976 and the assumptions on which the estimates were based were reported in the March 1978 "Tobacco Situation." A comprehensive cost survey has not been conducted in the Flue-cured study area but current plans call for a survey of Flue-cured tobacco producers in late 1979. However, cost budgets for two commonly used harvest systems (a conventional and a bulk system) have been published annually for Flue-cured tobacco in either the June or September "Tobacco Situation" for the last 5 years. These budgets are useful for showing cost changes from year to year but do not reflect the average costs of all Flue-cured tobacco producers.

Results of the survey of Burley tobacco producers indicate that the variable costs of producing Burley tobacco averaged 61 cents a pound in 1976. Almost two-thirds of variable costs were labor costs. And two-thirds of labor costs represented operator and family labor which was valued at the prevailing hired wage rate. Fertilizer costs were about 10 percent of variable costs. In 1976, total costs, which include variable costs, machinery and barn ownership, overhead costs, and a charge for management were 95 cents a pound. When land and quota costs were added, total costs of producing a pound of Burley were \$1.32 in 1976.

We are currently preparing Burley tobacco cost estimates for 1977 and 1978, and projections for 1979. We plan to publish these figures in the December 1978 "Tobacco Situation."

Let's look at cost changes from 1976 to 1978 and preview what might be expected in 1979. I will specifically address Burley costs but the indicated direction of change applies to other types of tobacco as well. Our latest cost estimates for Flue-cured tobacco appear in the June 1978 "Tobacco Situation."

Variable costs of producing Burley tobacco in 1978 are estimated at 70 cents a pound, up from 65 cents in 1977 and 61 cents in 1976.

A big jump—nearly 20 percent—occurred in wage rates from 1976 to 1978. In addition, large jumps of 10–15 percent have occurred in fuel costs, machinery repair costs, and the purchase price of new machinery and barns. Tobacco pesticide costs have risen but at a more moderate rate of 6 to 8 percent over the 2-year period. Most of the rise is due to increased prices of insecticides used on tobacco. Fertilizer prices have been stable.

Total costs, excluding land and quota are estimated at \$1.07 a pound in 1978 compared with \$1.01 in 1977, and 95 cents in 1976. Total costs, including land and quota, are estimated at \$1.40 a pound in 1977 and \$1.49 a pound in 1978.

How much will Burley tobacco production costs change in 1979? The easy and safe answer to that question would be that they may increase, and drop the discussion at that point. But, let's examine some of the input components and discuss some of the factors affecting their costs.

Wage rates are likely to rise in again 1979. The big jump in wage rates in 1978 resulted from labor shortages and the rise in the Federal minimum wage rate of farmworkers covered by the legislation from \$2.20 per hour to \$2.65 per hour. The higher minimum wage rate affects both covered and noncovered farms, since they are competing for workers.

The minimum wage of covered farmworkers will increase to \$2.90 per hour in 1979. Wage rates are again likely to increase in 1979, but perhaps at a little slower rate than in 1978.

Machinery, equipment, and repair costs will probably increase again in 1979 because of hikes in material and labor costs.

Fertilizer prices are expected to remain stable in 1979 because of ample supplies of all the principal nutrients—nitrogen, phosphates, and potash. Pesticide prices are also likely to change little.

Fuel prices are expected to continue upward because of increased costs of developing and supplying fuels.

In summary, the cost of producing tobacco in 1979 likely will rise. The rise may not be as great as in 1978, but it probably will not be significantly below it either.

ENERGY

ENERGY CONSUMPTION IN TEXTILES AND APPAREL

(By Annette Polyzou, Home Economist, Science and Education Administration,
USDA)

Rising energy prices and uneasiness about energy supplies have caused continued concern about energy consumption in all areas of the economy. Energy is consumed both in the production and use of textiles and apparel. For assessment of the need and opportunities for energy conservation in this area, two questions are basic: (1) How much energy is consumed in the production of textiles and apparel in the United States in a year? (2) Which type of fiber—natural or manmade—consumes more energy in terms of production, maintenance, and wear-life of a garment? Before discussing these questions, we should understand the relative importance of clothing as an item of consumption and examine trends in consumption of fibers in the United States.

Clothing and shoes comprised only 6.6 percent of personal consumption expenditures during the first three quarters of 1978 (table 1). These items, however, are purchased frequently by individuals and require a great amount of care. The average per person expenditure on clothing and shoes in the first three quarters of 1978 (\$398) was higher than the corresponding amount in 1977 (\$376). Half of the increase resulted from a rise in prices and half from increased buying.

During the past 3 years, the price level for apparel and upkeep, as measured by the Consumer Price Index (CPI), has increased at an annual rate of between 3.7 and 4.5 percent, less than the increase for all items of the CPI (table 2). Preliminary estimates for the first three quarters of 1978 indicate that price increases are lower for 1978 than for any of the previous 3 years.

During the past three decades, consumption of fibers produced from petroleum has steadily increased, while consumption of other fibers generally declined (9). During the period 1950 to 1977, U.S. per capita mill use of the natural fibers (cotton, wool, flax, and silk) and the cellulosic manmade fibers (mainly rayon and acetate) on a per capita basis, generally declined (table 3). Per capita consumption of cotton dropped from 30.9 pounds in 1950 to 14.7 pounds in 1977, wool dropped from 4.2 pounds to 0.5 pound, flax and silk dropped from 0.1 pound to a negligible amount, and cellulosic manmade fibers dropped from 8.9 pounds to 4 pounds. U.S. per capita consumption of the noncellulosic manmade fibers (mainly polyester, nylon, acrylic, modacrylic, olefin, and vinyon), however, rose from 0.9 pound in 1950 to 37 pounds in 1977. As a percent of total per capita consumption, cotton accounted for about 69 percent in 1950 and dropped to about 26 percent in 1977. Noncellulosic man-made fibers, on the other hand, accounted for only about 2 percent of total per capita fiber consumption in 1950 and rose to about 66 percent in 1977.

TABLE 1.—ANNUAL EXPENDITURES ON CLOTHING AND SHOES

Years	Per capita expenditures ¹		Percent of expenditures for personal consumption		Aggregate expenditures	
	Constant dollars (1972)	Current dollars	Constant dollars (1972)	Current dollars	Billions of constant dollars (1972)	Billions of current dollars
1960.....	203	148	8.1	8.2	36.6	26.7
1961.....	203	149	8.1	8.2	37.3	27.4
1962.....	209	154	8.1	8.1	38.9	28.7
1963.....	209	156	7.9	7.9	39.6	29.5
1964.....	222	166	8.1	8.0	42.6	31.9
1965.....	227	172	7.9	7.8	44.2	33.5
1966.....	239	186	8.0	7.9	46.9	36.6
1967.....	236	192	7.8	7.8	46.9	38.2
1968.....	242	208	7.7	7.8	48.6	41.8
1969.....	245	223	7.6	7.8	49.6	45.1
1970.....	240	227	7.4	7.5	49.2	46.6
1971.....	249	244	7.5	7.6	51.6	50.5
1972.....	264	264	7.5	7.5	55.1	55.1
1973.....	281	291	7.7	7.6	59.2	61.3
1974.....	279	308	7.8	7.3	59.1	65.3
1975.....	288	328	7.9	7.2	61.4	70.1
1976.....	298	352	7.8	6.9	64.2	75.7
1977.....	307	376	7.8	6.8	66.6	81.5
1978 ²	317	398	7.8	6.6	69.3	86.9

¹ Calculated by dividing aggregate expenditures for each year by population figures for July of each year.

² Preliminary figures—average of estimates for first 3 quarters of 1978 (i.e., seasonally adjusted quarterly totals at annual rates).

Sources: U.S. Department of Commerce, Bureau of the Census, 1978, Population estimates and projections, Current Population Reports, series P-25, No. 729 (table C). U.S. Department of Commerce, Bureau of Economic Analysis, 1978, Survey of Current Business (table 11) 58(8):10; and personal communication with the Bureau of Economic Analysis.

TABLE 2.—ANNUAL PERCENTAGE CHANGE IN SELECTED INDEXES OF CONSUMER PRICES

Consumer Price Index	1974	1975	1976	1977	1978 ¹
All items.....	+11.0	+9.1	+5.8	+6.5	+7.2
Apparel and upkeep ²	+7.4	+4.5	+3.7	+4.2	+3.4
Men's and boys' clothing.....	+7.9	+4.3	+3.5	+4.6	+2.4
Women's and girls' clothing.....	+6.0	+2.4	+2.8	+3.2	+1.8
Footwear.....	+6.1	+4.4	+4.0	+4.7	+3.4
Other apparel commodities ³				+4.6	-1.0

¹ Preliminary estimates—average for first 3 quarters of 1978 compared with the average for first 3 quarters of 1977.

² Also includes infants' wear, sewing materials, jewelry, and apparel upkeep services, for which indexes are not available.

³ Developed in 1976 to include diapers, yard goods, earrings, wrist watches, and zippers.

Source: U.S. Department of Labor, Bureau of Labor Statistics, 1978, News, Consumer Price Index (monthly issues); and personal communication with the Bureau of Labor Statistics.

In view of the fact that noncellulosic manmade fibers accounted for about 66 percent of total per capita fiber consumption in 1977 and are derived from petroleum, one might assume that a switch from man-made to cotton fiber would save energy. But cotton production also requires petroleum and other energy sources.

In addition, production of fibers is just one segment in the whole chain of production and use of textiles: fiber to fabric to garment to maintenance to the end of a garment's life. According to one study (13), fiber production accounted for less than 15 percent of the total energy consumed in the production and maintenance of a specific garment, while maintenance of the garment, with commonly used laundering practices, accounted for approximately 55 to 80 percent. These data suggest that choice of fiber may be less important to energy conservation than adoption by the consumer of practices that reduce energy use in maintenance or extend the wear-life of garments.

ENERGY USED IN TEXTILE PRODUCTION

Energy consumed in the production of textiles and apparel in 1976 (the most recent data available) totaled 1.135 quadrillion British thermal units (Btu's)¹ (table 4). The production of fibers consumed the greatest amount of energy—0.749 quadrillion Btu's or about 66 percent of total energy consumed for textiles and apparel in 1976. The processing of fibers in textile mills consumed 0.329 quadrillion Btu's of energy or about 29 percent of total energy consumed. The manufacture of apparel and other textile items consumed 0.057 quadrillion Btu's of energy—only about 5 percent of the total energy consumed for textiles and apparel in 1976.

The textile mills and manufacturing industries (not including fiber production) consumed only about 3.1 percent of total energy consumed by all U.S. industry groups in 1976, and ranked seventh in energy consumption behind chemicals, primary metals, paper, petroleum and coal, stone, clay and glass, and food industry groups. These six industry groups consumed about 80 percent of the energy consumed by all major industry groups in 1976 (7).

TABLE 3.—U.S. PER CAPITA CONSUMPTION OF FIBERS

Year	Manmade fibers						Natural fibers					
	Total		Cellulosic		Noncellulosic		Cotton		Wool		Flax and silk	
	Pounds	Percent	Pounds	Percent	Pounds	Percent	Pounds	Percent	Pounds	Percent	Pounds	Percent
1950.....	45.0	100.0	8.9	19.8	0.9	2.0	30.9	68.7	4.2	9.3	0.1	0.2
1960.....	35.8	100.0	5.8	16.2	4.2	11.7	23.4	65.4	2.3	6.4	.1	.3
1970.....	46.2	100.0	6.9	14.9	19.3	41.8	18.8	40.7	1.2	2.6	(1)	(2)
1977 ³	56.2	100.0	4.0	7.1	37.0	65.8	14.7	26.2	.5	.9	(1)	(2)

¹ Less than 0.1 pound.

² Less than 0.1 percent.

³ Preliminary figures.

Source: U.S. Department of Commerce, Bureau of the Census, Statistical Abstract of the United States, 1978, Table 1428—Mill consumption of natural and manmade fibers: 1950–77, p. 824.

TABLE 4.—ENERGY CONSUMPTION FOR TEXTILES AND APPAREL PRODUCTION IN 1976

Category	Quantity of energy (quadrillion Btu's)	Quantity of energy per pound of fiber (Btu's)	Percent of total
Production of fiber.....	.749	-----	66
Cotton.....	(.103)	20,600	(14)
Wool.....	(.001)	1,786	(.1)
Cellulosic manmade.....	(.082)	-----	(11)
Rayon.....	-----	96,218	-----
Acetate.....	-----	100,995	-----
Noncellulosic manmade.....	(.563)	85,027	(75)
Production of apparel and other textile items:			
Textile mills.....	.329	-----	29
Textile manufacturing industries.....	.057	-----	5
Total.....	1.135	-----	100

Sources: Textile Organon, 1978, Tables: Manmade fiber production; noncellulosic fiber production detail, Vol. XLIX, No. 2, p. 12, U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service, 1978, Crop Production Report, May 9, 1978, issue; and personal communication with Millie Jones. U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service, 1978, personal communication with Allen Evans. VanArsdall, R. T., and Starbird, I. R., 1978, Energy, another dilemma faced by cotton. Proceedings of the 1978 Beltwide Cotton Production-Mechanization Conference, Dallas, Tex., January 1978, pp. 48–52; and personal communication with R.T. VanArsdall, U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service, Washington, D.C. U.S. Department of Commerce, Bureau of the Census, 1978, fuels and electric energy consumed—industry group and industries, Annual Survey of Manufacturers, 1976, M76(AS)-4.1, Washington, D.C.: U.S. Government Printing Office. van Winkle, T. L., Edeleanu, J., Prosser, E. A., Walker, C. A., 1978, Cotton versus polyester, American Scientist 66(3): 280–290; and personal communication with T. L. van Winkle. The Wool Bureau, Inc., 1978, personal communication (September 22) with Marguerite Gadel, 360 Lexington Avenue, New York City, N.Y.

¹ Btu is the quantity of heat required to raise the temperature of 1 pound of water by 1 degree Fahrenheit.

Production of fiber

Cotton production accounted for about 14 percent of energy consumed in the production of all fibers (12), while the energy consumed in wool production was only about 0.1 percent (4, 6). These fibers accounted for about 29 percent and 1 percent, respectively, of fiber consumption in 1976 (9). Energy consumed in the production of man-made fibers, including the raw materials and production processes, accounted for the largest share—86 percent (including 11 percent for cellulosic and 75 percent for noncellulosic fibers) (13).

Energy consumption for cotton production can be broken down by type of fuel or electric energy used as follows: Natural gas, used for chemicals, fertilizers, irrigation, ginning, and compressing, accounted for about 59 percent of total energy consumption for cotton production; diesel, used for field operations and irrigation, accounted for about 22 percent; gasoline, used for farm business transportation, field operations, and irrigation, accounted for about 11 percent; electric energy, used for irrigation, accounted for about 6 percent; and LP gas used for irrigation and field operations, accounted for about 2 percent (12) (table 5). Energy consumed in the production of wool is for farm operations—mainly the shearing of sheep (4).

The production of cellulosic and noncellulosic manmade fibers requires petroleum or natural gas to produce the petrochemicals (the raw materials) for the noncellulosic fibers and energy to convert the petrochemicals (for the noncellulosics) and the wood cellulose (for the cellulotics) into fibers (13). Energy consumption by type of fuel or electric energy was not available for cellulosic manmade fibers. Energy consumption data on type of fuel or electric energy consumed for non-cellulosic manmade fiber production was only available for energy consumed in the conversion of petrochemicals to fibers—fuel oil (39 percent), coal (30 percent), electric energy (19 percent), and natural gas (12 percent) (7).

Production of apparel and other textile items

Energy consumed in textile mills and manufacturing industries is used mainly for apparel (about 81 percent) (7). The production of carpets consumed about 7 percent, miscellaneous textile goods (felt goods, lace goods, paddings and upholstery filling, processed textile waste, coated fabrics, tire and cord fabric, nonwoven fabric, and cordage and twine) about 7 percent, and miscellaneous fabricated textile products (curtains and draperies, housefurnishings, textile bags, canvas and related products, pleating and stitching, automotive apparel trimmings, and machine embroideries) about 5 percent.

TABLE 5.—PERCENT OF TOTAL ENERGY CONSUMPTION FOR TEXTILES AND APPAREL BY TYPE OF FUEL OR ELECTRIC ENERGY CONSUMED IN 1976

Category	Gasoline	Diesel	Liquid propane	Natural gas	Fuel oil	Coal	Electric energy
Production of fiber:							
Cotton.....	11	22	2	59	(1)	(1)	6
Noncellulosic manmade.....	(1)	(1)	(1)	12	39	30	19
Production of apparel and other textile items:							
Textile mills.....	(1)	(1)	(1)	27	31	10	32
Textile manufacturing industries.....	(1)	(1)	(1)	31	17	2	50

1 Not available.

Sources: U.S. Department of Commerce, Bureau of the Census, 1978, "Fuels and Electric Energy Consumed—Industry Group and Industries," Annual Survey of Manufacturers, 1976, M76 (AS-4.1). VanArsdall, R. T., and Starbird, I. R., 1978, "Energy, Another Dilemma Faced by Cotton," U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service paper presented at the 1978 Beltwide Cotton Production-Mechanization Conference and special sessions on cotton; and personal communication with R. T. VanArsdall.

Textile mills produce mainly yard goods, but also produce some finished items such as carpeting and knit underwear and hose. Energy consumed in these mills can be broken down into 29 percent for weaving, 23 percent for textile finishing, 17 percent for knitting, 14 percent for spinning, 9 percent for rug and carpet production, and 8 percent for production of miscellaneous textile goods. Textile energy consumption can also be broken down by type of fuel or electric energy used as follows: Electricity (32 percent), oil (31 percent), gas (27 percent), and coal (10 percent).

Textile manufacturing industries complete the process of producing apparel and other textile items from yard goods. Energy consumed in these industries can be broken down by type of fuel or electric energy used into 50 percent electricity, 31 percent gas, 17 percent oil, and 2 percent coal.

NATURAL VERSUS MANMADE

Some individuals may think that the trend to greater use of man-made fibers has in itself increased the consumption of energy and that energy could be saved by greater use of natural fibers. But figures on total consumption of energy for fiber, fabric, and garment production in the United States reflect different amounts produced. These figures do not indicate how the total would change if natural fibers were substituted for manmade fibers. For comparison between natural and manmade it could be necessary not only to compute the energy used in producing a pound of each type of fiber, but also to determine the amounts of fiber used in garments with comparable uses, to measure the energy used in producing and maintaining those garments, and to compare the garments' wear-life. The results might vary considerably by type of garment, maintenance practices, and use. Such comparative data are available from only one study that compared energy consumed in the production and maintenance of a 100-percent cotton shirt with a 65/35-percent polyester/cotton shirt.² Results of this study suggest that, overall, the 100 percent cotton shirt is the more costly in terms of energy use. The estimates indicated that although a shirt produced from manmade fiber requires about one-fourth more energy to produce than a shirt produced from natural fibers, the natural-fiber shirt requires more than twice as much energy to maintain over the same number of laundering cycles and lasts only two-thirds as long (table 6). For both types of shirts, but especially for the 100 percent cotton one, more energy is required to maintain (using common laundering practices) than to produce. The total energy required for production and maintenance, assuming an equal wear-life and commonly used laundering practices, was estimated as 115.5 kWh for the cotton shirt, compared with 72.4 kWh for the polyester/cotton blend.

*Production*³

The total energy required for fiber, fabric, and shirt production for a 100-percent cotton shirt was estimated by van Winkle et al. to be 26.3 kWh versus 32.6 kWh for a 65/35 polyester/cotton blend shirt.

² The research was a 3-year study conducted by T. L. van Winkle et al. during the years 1974 through 1976 [2, 13]. The study investigated energy consumption through four stages: (1) fiber production, (2) fabric production, (3) shirt production, and (4) maintenance.

³ Relative amounts of energy consumed in fiber production compared with fabric and garment production differ between table 4 which pertains to the production of textiles and apparel as a whole and table 6 which pertains to the production of a particular item of apparel. Relative amounts of energy are likely to differ with the type of textile item produced. Also, the quantities of energy consumed in the production of fibers in table 4 include fibers that are exported.

The energy consumed in the production of 1 pound of cotton fiber was estimated at 6.1 kWh, including fuel and electricity for farm equipment, irrigation and ginning, and energy associated with the production of fertilizers and pesticides. This figure is similar to the one reported by the National Cotton Council of America (6 kWh) (1). The energy consumed in the production of 1 pound of polyester fiber was 21.6 kWh, including energy required for the removal of petroleum from the ground, for the production of petrochemicals, and eventually for the production of the fiber. The amount of fiber required to produce one shirt varies by fiber. The production of a 100-percent cotton shirt required 0.82 pound of cotton and the production of a 65/35-polyester/cotton blend shirt required 0.62 pound of polyester and cotton (0.37 pound of polyester and 0.25 pound of cotton), according to van Winkle and others. The energy required to produce enough fiber for a 100-percent cotton shirt and a 65/35-polyester/cotton blend shirt was 5 kWh and 9.6 kWh, respectively.

The energy consumed in the manufacture of fabric for shirts from the raw fiber includes the electricity, steam, and natural gas consumed by weaving and finishing mills.⁴ Energy for production of cloth for a 100-percent cotton shirt and a 65/35 polyester/cotton blend shirt was estimated at 18.5 kWh and 20.2 kWh, respectively.

Energy required to manufacture a shirt was estimated to be 2.8 kWh (for either type of shirt), based on a 2-year average amount of electricity and natural gas used per dozen shirts for operating machinery and for heating and air-conditioning plants.

*Maintenance and wear-life*⁵

Energy required to maintain each type of shirt through 50 cycles of washing, drying, and ironing was estimated at 89.2 kWh for the cotton shirt and 39.8 kWh for the blend shirt (table 6). This included energy to wash, dry, and iron garments by laundering practices commonly used in the United States—washing and drying in automatic machines with segregated loads (cotton on regular cycle, hot wash and hot rinse, and polyester/cotton blends on permastress cycle, hot wash, cold rinse); removing shirts from the dryer when dry; and using an electric iron for both types of shirts. By use of energy-conserving laundering methods,⁶ the energy required to maintain each type of shirt through 50 cycles of washing, drying, and ironing could be reduced to about one-third for the cotton and the blend shirt (31 and 13.7 kWh respectively).

The 65/35 polyester/cotton blend shirt was estimated to last 75 laundering cycles, about 1½ times as long as the all-cotton shirt, which lasted only 50 cycles. Taking this into account, the cotton shirt would consume even more energy than the blend for production and use.

In actual use, the wear-life of garments may vary considerably among consumers. Changes in fashion may cause garments to be discarded long before they actually are worn out, or individuals may

⁴ Energy consumed by weaving and finishing mills was 6.53 kWh yd² for 100 percent cotton fabric and 7.13 kWh yd² for the 65/35 polyester/cotton blend fabric. The amount of fabric required for the production of a shirt was given as 2.833 yd².

⁵ Estimates of energy consumed in maintaining each type of shirt as well as estimates of wear-life of the shirts used by van Winkle et al. were based on data available from other studies.

⁶ This included an energy- and water-saving automatic washer (wash water for two loads, warm wash, cold rinse—both types of shirts), no automatic dryer, and an electric iron.

treat some garments with extra care, thus greatly increasing their wear-life. Maintenance practices may also differ from the study method. Garments washed in warm or cold water rather than hot water, hung to dry rather than put in the dryer, and worn without ironing would consume less energy for maintenance.

TABLE 6.—COMPARISON OF ENERGY CONSUMPTION IN THE PRODUCTION AND MAINTENANCE OF A 100 PERCENT COTTON AND A 65/35 POLYESTER/COTTON BLEND SHIRT

Category	100 percent cotton (kilowatt-hours)	65/35 polyester/ cotton blend (kilowatt-hours)
Fiber production.....	5.0	9.6
Fabric production.....	18.5	20.2
Shirt production.....	2.8	2.8
Total production.....	26.3	32.6
Maintenance ¹	89.2	39.8
Total.....	115.5	72.4

¹ Based on 50 laundering cycles.

Source: Adapted from van Winkle, T. L., Edeleanu, J., Prosser, E. A., and Walker, C. A., 1978, cotton versus polyester (table 4). "American Scientist" 66(3): 286.

ENERGY CONSERVATION

According to several trade sources, energy-conserving techniques have already been introduced in the fiber, fabric, and garment-production areas of textiles and apparel. They have been adopted in the production of both natural and manmade fibers. Such conservation programs are expected to continue and expand.

Consumers may conserve energy by altering their maintenance practices, by extending the wear-life of garments where possible, and selecting garments that require less energy for maintenance. For example, a no-iron, all-cotton shirt, soon to be available on the market, will provide convenience and some energy savings (14). Means of conserving energy used in maintenance include using laundering equipment with energy conserving features, using cold water for wash and rinse cycles, hanging garments to dry, and reducing the need for frequent laundering by means of spot cleaning and wearing protective coverings such as aprons and underarm shields. The wear-life of garments may be extended by less frequent laundering of garments, by greater care in wearing and storing garments, and by selecting styles and fabrics that will be acceptable for longer periods of time. Sanitation as well as the general appearance of garments should be considered in deciding on specific means of conserving energy.

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CURRENT AND FUTURE DIRECTIONS IN RESEARCH ON CONSUMER TEXTILE PRODUCTS¹

(By Tyrone Lawrence Vigo, Director and Research Leader, Textiles and Clothing Laboratory, USDA, SEA, Agricultural Research, Knoxville, Tenn.)

It is important that all research programs (Government, industrial and academic) be assessed and updated periodically to make sure that the priorities are consistent with the overall goals and mission of a research organization. The Textiles and Clothing Laboratory of the U.S. Department of Agriculture, Science and Education Administration, Agricultural Research (USDA, SEA, AR) has recently completed an assessment of its research program which hopefully is consistent with national goals and needs. The research mission, current intramural and extramural research, and future directions of the Laboratory will be described, with particular emphasis on proposed research on how textiles and clothing may be employed most effectively and efficiently to conserve energy and provide thermal comfort indoors.

MISSION

The mission of the Textiles and Clothing Laboratory of the USDA, SEA, AR is to conduct basic and applied research on textiles and textile products. Emphasis is given to research on the most effective use and care of textiles, clothing, and home furnishings available to consumers, and research to develop fundamental information on clothing for people with special needs (such as the elderly, the physically or mentally handicapped, and fieldworkers who apply agricultural chemicals). The Laboratory then disseminates the research results and recommendations in technical and popular publications to consumers, agribusiness, the textile and allied industries, and to liaison personnel working with consumers, farm workers, and people having special clothing needs. More specifically, research is conducted to:

- (1) Develop scientific principles for and information on improving the service life, comfort, durability, aesthetic qualities, safety, and health aspects of textiles, and effective use of textiles in energy conservation.

- (2) Develop methods and instrumentation for evaluating functional and esthetic properties of textiles to predict service life, acceptability, and performance levels.

- (3) Identify, describe, and establish criteria for the properties required in textiles to more effectively meet the needs and wants of consumers and other users.

¹ This paper draws upon, to a large extent, the collaborative efforts of the USDA Textiles and Clothing Staff, the SEA Area Director (Dr. George Burns), the dean, associate dean of the College of Home Economics and head of the department of textiles and clothing at the University of Tennessee, Knoxville (Dr. Lura Odland, Dr. Grace Goertz, and Dr. Anna Jean Treece) and staff members of that department in formulating new research directions on consumer textile products.

Our research mission and program is prodigious in scope and involves an interdisciplinary approach that primarily includes the disciplines of chemistry, physics, microbiology, home economics, statistics, engineering, and polymer and material science. It thus requires the application of knowledge and understanding of how each of these disciplines can be most effectively employed to accomplish the Laboratory's mission.

PRESENT INTRAMURAL RESEARCH

Intramural research projects and activities include (1) evaluation of the performance of blankets and bedding materials with emphasis on such characteristics as linting, shedding, dimensional stability, hand, colorfastness, and other esthetic properties and measurement of heat retention (warmth) and its relationship to thermal comfort; (2) development and evaluation of functional clothing for the handicapped, esthetic and performance characteristics of fusibles in garments, and evaluation of fusing and ultrasonic bonding construction techniques used in fabricating garments; (3) development of prototype draperies that function as solar heat collectors and/or reflectors at low temperatures by optimizing solar radiation and heat transfer at windows. (The utilization of fabric laminates, coated fabrics, and other textile structures to produce desirable heat-transfer properties, and the measurement of thermal transmission properties by existing and devised instrumentation, constitutes the major effort in this project); (4) revision of the most frequently requested consumer publications on textiles, which include "Your Clothes: Textiles and Fabrics," "Sanitation in Laundering," and "Clothing Repairs."

PRESENT EXTRAMURAL RESEARCH

In addition to intramural research activities the Textiles and Clothing Laboratory is engaged in a variety of cooperative endeavors with universities, other Government laboratories and facilities, research institutes, and other interested organizations. Some of the cooperative arrangements are funded either by the SEA Textiles and Clothing Laboratory or the cooperating organization, whereas others are arrangements involving only personnel, common interests, and professional expertise.

Under a broad form agreement between the SEA Textiles and Clothing Laboratory and the University of Tennessee, Knoxville, the Laboratory may engage in cooperative research efforts with any and all interested departments on that campus. However, most cooperative efforts are with the Department of Textiles and Clothing because of the mutual interest and expertise in many areas of textile research. The Laboratory also has engaged and will engage in cooperative efforts with the departments of chemical and polymer engineering and other departments in the college of engineering, chemistry, and physics (a new graduate program in textile science and engineering will soon be implemented), and with the Environment Center. Present cooperative activities between the SEA Laboratory and the department of textiles and clothing include the investigation of comfort, mechanical properties of nonwoven fabrics and chemical properties of their binders, free formaldehyde present in apparel, and surface properties of textiles. Related cooperative endeavors enable staff members of SEA Textiles and Clothing Laboratory to hold courtesy appointments in

the department of textiles and clothing, and thus serve as directors or codirectors of dissertations and theses, members of graduate student committees, guest lecturers, and participants in seminars and short courses, and as time permits, teach and take part in other department activities. Graduate and undergraduate students who contribute to research in the SEA Laboratory obtain valuable research experience and funding, thus sharing the resources of the new Science and Education Administration (SEA) of the U.S. Department of Agriculture.

Specific cooperative agreements awarded to several universities are in various stages of progress. Universities and colleges which have been or will be awarded agreements are the University of Tennessee, the University of Maryland, Auburn University, Louisiana State University, New York University, and 1890 land-grant colleges: Southern University at Baton Rouge and Tennessee State University at Nashville. Research projects at these universities study launderability of flame-retardant sleepwear, durable press fabrics with low free formaldehyde, hand and comfort in garments, assessment of clothing comfort using a gas tracer technique, microbiology of skin-clothing interfaces, properties of suede-like fabrics, effect of drying and laundering time on apparel and its importance in energy-saving strategies, soiling characteristics of flame-retardant fabrics, and mechanisms of fiber fatigue.

Cooperative activities of the SEA Textiles and Clothing Laboratory with other facilities include evaluation of performance characteristics of shirts made from selected cotton/polyester blends (Southern Regional Center, New Orleans, La.); evaluation of shirts and trousers worn by fieldworkers for pesticide residues (SEA Boll Weevil Laboratory, Raleigh, N.C.); evaluation of selected fabrics for conformance to specifications for Forest Service uniforms (USDA Forest Service, Washington, D.C.); and liaison activities in preparing the most popular and useful consumer textile bulletins (GSA Consumer Information Center, Washington, D.C.).

FUTURE DIRECTIONS

As an integral part of the long-range plans for the next decade of cooperative research of the USDA, SEA Textiles and Clothing Laboratory and the Department of Textiles and Clothing at the University of Tennessee, Knoxville, the following four areas of research were identified: (1) textiles in energy conservation, (2) clothing for people with special needs, (3) end-use performance of textiles, and (4) safety of textiles containing additives and contaminants. An overview and justification for each area were developed with three or more specific projects listed as examples within each area. Each project includes descriptions of the problem, objectives, state-of-the-art approach, user benefits, and needed resources, and a glossary. Potential accomplishments are projected within present and increased levels of funding. Several SEA and University of Tennessee administrators and research personnel attending a long-range planning conference ranked the four areas in terms of importance and relevance. Textiles in energy conservation received the highest ranking, followed closely by end-use performance of textiles. Projects and research strategies will be described for the first area, and appropriate references listed for those interested in obtaining additional information.

EFFECTIVE USE OF TEXTILES FOR ENERGY CONSERVATION

In this country at present, clothing and textiles are designed primarily for fashion, esthetics, and durability rather than thermal comfort. The thermal comfort of individuals in their homes is a significant factor in whether thermostats are maintained at household temperature levels recommended for conserving energy. Textiles used in clothing and bedding can increase thermal comfort so that less energy is needed to maintain adequate comfort.

In addition, textiles, through use in draperies and floor coverings, can help reduce heat loss from buildings. Twenty to fifty percent of household heating costs are due to heat loss through windows, which represent only 4 to 20 percent of the exposed surface area of a house. The insulative (R) value of carpet plus padding is generally one-fourth that of an insulated 2 by 4 stud wall.

Because of the cost of textiles and the complexity of the factors involved in thermal comfort, research problems on effects of textiles on energy conservation will not be simple. Establishing models for home furnishings, apparel, and bedding used indoors that lower energy requirements and provide thermal comfort at recommended or more conservative thermostat settings, is a new goal for consumer textile research.

The laboratory is planning the following specific research projects that examine the effective use of textiles and clothing indoors to conserve energy and provide thermal comfort: (a) thermophysical properties of textiles, (b) fabric assemblies for thermal comfort, (c) blankets and bedding for thermal comfort, (d) models for insulated draperies, and (e) combined effect of textiles and clothing on thermal comfort indoors.

Thermophysical properties of textiles

The thermophysical properties of textiles are important to the overall dynamic response and insulation that textile assemblies afford. Thermal conductivity, specific heat, heat transfer (conduction, convection, and radiation), fiber structure, chemical treatment, and variables in the manufacturing process are known to have an effect on the thermal characteristics of textiles (1). Thermal conductivity and its reciprocal resistance, are readily measured and have been shown by many investigators to be essentially independent of fiber type but dependent primarily on construction and air layers trapped inside fabrics. However, resistance or conductivity is not readily predictable for textiles, although recent studies by the Japanese have made some progress in this regard. Studies have shown that the radiant properties of textiles are influenced by the color of fabrics and dyes used, orientation and length of fibers, and yarn twist and fabric structure. Specific heat of textiles has mostly been measured on wool; the high values observed for natural fibers suggest that these fibers can buffer sudden temperature changes.

Over the years, a variety of instruments have been used for measuring the thermal transmission properties of textiles. Most of these instruments measure relative thermal resistance or conductivity while holding convection and radiation factors constant. Some of the instruments available are able to measure moisture transport and thermal transmission simultaneously. Techniques or methods for

measurement also differ and may be classified as (a) constant temperature, (b) rate of cooling or warming, and (c) heat flow meters or discs.

When investigating thermophysical properties, we will identify and optimize differences and changes in heat transfer, thermal resistance, specific heat, and other thermophysical properties of textiles as they relate to aspects of thermal comfort. The contributions of fiber structure, orientation, crystallinity, draw ratios, and fabric construction have on thermophysical properties will be assessed. Various chemical finishes and treatments will be evaluated for their ability to cause changes in thermophysical properties. Techniques such as microencapsulation of phase-change materials and application of surface coatings will be utilized to improve or optimize such properties. Appropriate instruments will be purchased or modified.

Fabric assemblies for thermal comfort

In the past two decades, many laboratories and researchers have investigated the complex area of clothing comfort (2, 3, 4). Research on thermal comfort factors and physiological aspects of clothing for the military and for civilian garment design has been extensive. However, most of the studies have examined clothing in extreme climatic situations and conditions. Studies by Goldman, Breckenridge, and others at the U.S. Army Quartermaster Corps at Natick have concentrated on physiology and have led to the development of a sweating hot plate and copper mannequin, both of which measure clothing insulative value (clo) and evaporative heat transfer at the skin (i_m) (3, 4). Mecheels in Germany has taken a similar approach and has developed an apparatus capable of measuring thermal properties of layers of fabric and a walking mannequin to simulate comfort properties of textiles (4).

Other workers have addressed the interrelationships between a clothed person and room environment parameters with respect to thermal comfort. Fanger (5) has developed a thermal comfort equation consisting of six parameters important in indoor structures: metabolic activity of occupants, clothing insulative value, air temperature, mean radiant temperature, air velocity, and relative humidity. Burton has derived an equation which yields ambient room temperature for thermal comfort (6). The important parameters in this equation are skin temperature, metabolic activity of occupants, evaporative heat loss of water from occupants, surface area of the body, insulation provided by air boundary layer of outer surfaces, and insulative or clo value of apparel.

The research approach for utilizing clothing to provide thermal comfort indoors is to select representative fiber/fabric combinations available to consumers and determine their clo or insulative values with instruments that measure the thermal transmission properties of fabric assemblies. These clo values can then be related to thermal comfort and preferred thermostat temperatures by inserting them in appropriate instruments such as the Comfytest¹ (an apparatus which has the capability of evaluating the six variables in Fanger's thermal comfort equation).

¹ Mention of a trade name does not constitute a recommendation or endorsement of that product by the U.S. Department of Agriculture to the exclusion of other suitable products.

Blankets and bedding for thermal comfort

Blankets and bedding material have been studied with respect to their changes in surface appearance and warmth due to laundering and use. Various instruments have been used to measure the insulative value of blankets, but only one has been designed specifically to consider the importance of moisture transfer as well as thermal transmission properties of bedding materials (7). The use and effectiveness of impermeable layers in cold weather clothing, footwear, and blankets for the military have been extensively investigated.

To evaluate blankets and bedding materials indoors, we plan to select representative blankets, sheets, impermeable covers, and bedspreads, and design models containing one or more blankets whose clo values can be measured by using suitable heat transfer equipment. We probably will have to design new equipment or modify existing equipment in order to realistically evaluate blanket performance in this regard. The clo or insulative values obtained can be related to the air temperature and other variables and thus to changes in thermostat settings and energy expenditure necessary to provide thermal comfort indoors.

Models for insulated draperies

Textiles for interiors, such as carpets and draperies, have different effects on thermal comfort since these items do not come in direct contact with persons. Investigations have shown that carpet installation saves fuel and energy. The most recent and comprehensive study, conducted at Georgia Institute of Technology under the sponsorship of the Carpet and Rug Institute, demonstrates that the insulative value of carpets is proportional to their thickness and pile density, with the best combinations of carpet and padding reducing floor heat loss on uninsulated concrete slabs up to 54 percent (8). The percent of energy saved on annual heating and cooling bills ranged from 7 to 15 percent and was dependent to a large degree on configuration of the residence and its geographical location in the continental United States.

Most studies showing the effectiveness of draperies in reducing heat loss and gain have varied only the color and construction of the draperies and have minimized the "cascade" effect, which results from cold or warm air infiltrating the room at the bottom of the drapery. Medium-colored draperies with a white plastic backing reduced conductive heat loss in the winter by 7 percent and conductive and radiant heat gains in the summer by 33 percent. These and other related studies are summarized in a recent publication by the National Bureau of Standards (9). Although these effects are well recognized and documented, little research has been done to optimize the radiant and conductive properties of draperies or to determine the relative contributions of the various thermophysical properties of draperies as they relate to change in thermostat setting, thermal comfort, or decreasing energy consumption.

We plan to employ window enclosures that simulate temperature differences in winter and/or summer climates and to design and evaluate drapery prototypes that absorb, transmit, or reflect heat from or into living spaces efficiently in cold and hot climates. Laminates,

coated fabrics, and other innovative textile modifications will be evaluated in draperies for their ability to produce desirable heat-transfer properties for achieving overall energy conservation during seasonal and diurnal periods. Remote sensing devices and other suitable instruments will be employed to measure surface radiation and heat transfer of the textiles.

Combined effect of textiles and clothing on thermal comfort indoors

To evaluate the combined effect of all textiles used indoors in this regard, we need to be cognizant of building science technology and design. The following factors in building design are important in thermal studies: siting, volume, and shape, location of heating and cooling sources, insulation and condensation effects between walls, ventilation, fenestration (arrangement and design of windows and doors in a building), orientation of windows, and clothing worn by occupants (10). For example, the heat loss at night through a 1-meter-square, unobstructed clear-glass window is negligible when the window faces south but considerable when the window faces north (10).

Research on the combined effects of textiles in rooms would require an environmentally controlled room in which the window, floor, and ceiling surface temperatures were monitored by remote sensing devices such as infrared thermal scanners and thermovision cameras and the thermophysical variables of the fabrics used were optimized. The six variables important for thermal comfort (Fanger's equation) would be monitored and measured with appropriate instruments. The overall effect which textiles have indoors could then be translated into their efficiency for providing thermal comfort at conservative thermostat settings. This information could be utilized by textile manufacturers, businesses, and consumers to use appropriate thermostat settings and textile materials for reducing heating and cooling costs in residences, office buildings, hospitals, restaurants, hotels, motels, and other habitats.

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ENERGY OUTLOOK FOR FUEL IN 1979

(By R. Thomas VanArsdall, Policy Analyst, Office of Energy, USDA, and Patricia J. Devlin, Agricultural Economist, ESCS, NEAD)

SUMMARY OUTLOOK

Current indications suggest two predominant features for 1979: (1) Energy supplies will be adequate; and (2) energy prices will show a moderate increase. Placing energy price increases in perspective, (1) energy costs represent about 8 percent of total farm production costs and about 12 percent of the consumer food bill; and (2) over the last decade, costs of other factors of production have been increasing more rapidly than energy costs.

Long-term decisions should not be based on this favorable, short-term outlook. Eventually, the relative price of energy is likely to increase significantly. Energy price increases, although important, are not as important as the potential havoc that a disruption in energy supplies could produce. Mechanisms which can provide safeguards to essential energy supplies for the agricultural system include: (1) contingency allocation plans for petroleum products (Emergency Petroleum Allocation Act); and (2) an agricultural priority for curtailment plans of interstate pipelines (Natural Gas Policy Act of 1978).

PART I. ENERGY PRICES AND SUPPLIES: SITUATION AND OUTLOOK FOR 1979

Energy supplies adequate, prices up

The comprehensive energy package signed into law by President Carter on November 9, 1978, comes at a time when the energy supply situation is significantly better than it has been in recent years. Although there are no facts about the future, current indications suggest two predominant features for 1979: (1) Energy supplies will be adequate; and (2) energy prices will show a moderate increase.

Even if this winter proves to be as extreme as last winter (one of the coldest on record), no major problems are expected in meeting fuel demand through 1979. While some areas could experience short-term, spot shortages of some fuels, no region is expected to be placed in dire straits. Fuel prices are expected to continue the trend established over the past several years of moderate increases—generally reflecting inflationary pressures.

The improved availability and price situation for fuel reflects the reaction by both fuel producers and consumers to the shortages and sharp price increases experienced in recent years. On the producing side, higher prices, especially for petroleum products, have led to increased exploration and production. Associated with discoveries of petroleum have been discoveries of natural gas. On the demand side, consumers have responded to higher energy prices by practicing energy management, thereby saving dollars as well as energy. Many industrial

users, in response to recent natural gas curtailment, have begun to switch to alternate fuels or to add dual or multi-fuel capability for their plants. These activities have complemented efforts by distributors to improve distribution and storage facilities to create a brighter outlook for 1979.

Petroleum fuels

By the end of the summer, total U.S. demand for petroleum fuels was running about 3 percent above the first half of 1977. This includes a gasoline demand increase over last year approaching 4 percent. Domestic crude oil production was reported to be 8 percent higher in August 1978 than in August 1977.

Farm use of gasoline has been declining relative to diesel, a more efficient fuel source. This trend is expected to continue. At the same time the gap between gasoline and diesel prices has been narrowing, as a result of extended regulation of gasoline prices. Refiners have passed most of the burden of increased costs through middle distillates, including diesel. Indeed, the real cost of gasoline at the retail level, factoring out inflation, has been declining slightly over the past 2 years. A recent rule change by DOE has permitted a more equitable reallocation of a portion of increased crude oil costs to gasoline. This should ease price pressures on the middle distillates.

No shortage of gasoline or diesel is anticipated; nor should food processors expect any middle distillate supply problems. Petroleum product price increases are likely to fall at the lower end of a 5- to 10-percent range, dampened by the temporary upswing in world oil supplies. Farmers paid slightly over 61 cents a gallon for bulk delivery of gasoline and 47 cents a gallon for diesel fuel. Fuel oil cost farmers 49 cents a gallon. These prices represent averages as of October 1978.

OPEC price adjustments play significant role

The Organization of Petroleum Exporting Countries (OPEC) is presently debating the establishment of a new world price for crude oil. It has been reported that they are considering a range of from 5 to 15 percent. Many factors are likely to affect their decision, including the general abundance of oil on the world market, the rate of increase in demand for oil, and their perception of the degree of commitment by Western nations to the battle against inflation.

Should OPEC reach a decision in the near term and raise prices, most of 1979 likely would elapse before the cost increase is fully reflected in retail fuel prices. A 15-percent increase could translate into 3 to 4 cents per gallon at the service station.

Natural gas

The Federal Energy Regulatory Commission (FERC) projects that adequate natural gas supplies will be available for the coming winter. Approximately 6,780 billion cubic feet of gas are available for sale. This may be compared with 6,815 billion cubic feet delivered last year, during a record cold winter. (Last year at this time gas pipelines were reporting supply availability at 6,595 bcf, somewhat less than this year.) Moreover, in case of extreme conditions, an additional 172 billion cubic feet of emergency gas should be available to interstate users.

During the November 1977-March 1978 winter heating season, natural gas curtailments to industrial users totaled about 25 percent of requirements—considerably lower than had been predicted. In

most cases, alternate fuel capability existed. It has been estimated that curtailments will be slightly lower this season. There should be no significant industrial shutdowns related to natural gas shortages this winter.

The priority status accorded essential agricultural uses of interstate gas under the Natural Gas Policy Act of 1978 (NGPA) is not likely to be determined in final form for several months. It will be in effect for next year and beyond. It is hoped that the price incentives in the NGPA will stimulate an increased flow of natural gas, decreasing curtailments further. Indeed, recent articles have indicated an abundance of natural gas may exist over the next several years. Should this occur, the supply of natural gas could become more accessible to agricultural users.

The incremental pricing provisions of the NGPA state that natural gas prices to agricultural uses are to increase only at the rate of inflation in the near term.

LP gas abundance, low prices

Current LP gas inventories are the second largest in history, in spite of heavy demands for crop drying; and supply is unlikely to pose any problem. Domestic production of LP gas has tapered; but so has demand, due to conservation and a moderate slowdown in the economy. A worldwide surplus of LP gas exists, and offshore prices have softened to the point where they are approaching the market clearing price.

Many agricultural users turned to LP gas before 1973, when it was a "distressed" commodity and sold at less than average cost. When prices quadrupled, LP gas demand declined in the agricultural sector.

Retail prices vary by region. Currently, wholesale prices in the Southwest are 20 to 22 cents per gallon, with spot prices sometimes as low as 18 cents. In general, current wholesale contract prices are 7 to 8 cents per gallon below levels of a year ago—spot wholesale prices as much as 10 cents lower. Prices may rise slightly during the winter heating season. However, significant increases are unlikely over the next 12 months.

Natural gas price deregulation may have a tendency to pull LP gas prices up somewhat, but this likely will be counteracted by the surplus supply situation. Farmers paid an average of 39 cents per gallon for bulk delivery of LP gas in October 1978—down almost 4 percent from a year ago. This price should continue to drop as contracts expire and the wholesale price declines filter down to the retail level.

Electricity

The DOE reports that electricity generating capacity should be adequate to meet winter peak power demands. Total U.S. electrical power capability is reported at close to 500,000 megawatts. Projected peak needs should amount to 380,000 megawatts, leaving an adequate reserve. Only the Tennessee Valley area might experience some difficulty meeting peak demands if unusual situations arise. However, food processors and other agricultural users should be in good shape in terms of their electricity needs this winter and throughout 1979.

Farmers paid almost 4 cents per kilowatt-hour in 1978, an increase of over 8 percent from a year ago. During 1979 prices are likely to increase another 5 to 10 percent.

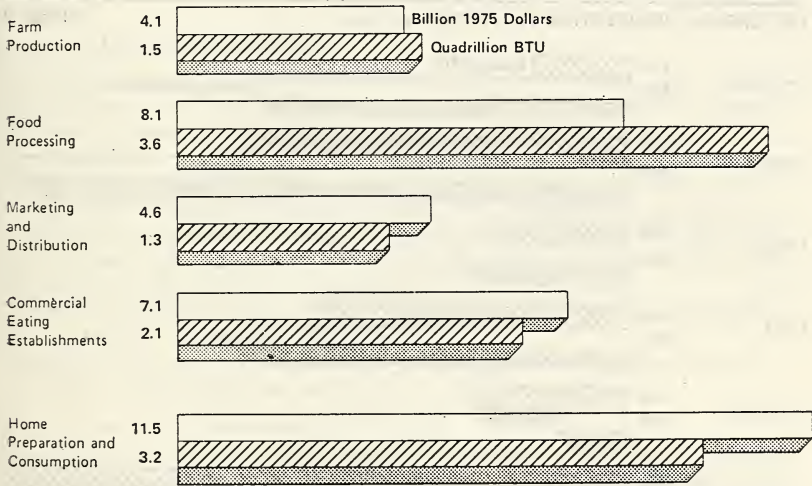
PART II. PLACING ENERGY IN PERSPECTIVE

Role of energy in agriculture

Over the past several decades, fossil energy has been plentiful and low cost relative to other production resources. Consequently, activities in the U.S. food, natural fibers, and forest products system have become heavily reliant on fossil fuels and electricity. An estimated 22 percent of the total energy used in the United States is related to the production, processing, marketing, and consumption of food, natural fibers, and forest products. Approximately 16.5 percent is used in food-related activities—production through consumption (figure 1). The remaining 5.5 percent is used for all aspects of natural fibers and forestry.

ENERGY IN U.S. FOOD SYSTEM, 1975

Figure 1



Less than 3 percent of the national total is devoted to the raising of crops and livestock. However, to comprehend the true importance of the role of energy in U.S. agriculture, it must be recognized that agricultural production is a biological process timed by the Sun, the seasons, and the rains. Temporary shortages of essential fuels can create long-term shortages of food through lost production and spoilage. In addition, dramatic gains in agricultural productivity have resulted from technological advances critically dependent on energy. Energy has been utilized in order to facilitate four major objectives:

Reduce labor requirements—for example, mechanization on the farm and convenience foods in the home;

Increase the quantity, quality, and variety of food produced while using less land, through increased chemical fertilizer and pesticide use;

Lower the risk of crop failure or food spoilage ("modify" weather)—for example, irrigation, crop drying, and refrigeration; and

Reduce waste and maintain or create a quality of food preferred by consumers, through more processing, packaging, and marketing.

These trends will probably continue for some time into the future.

Energy for agricultural production

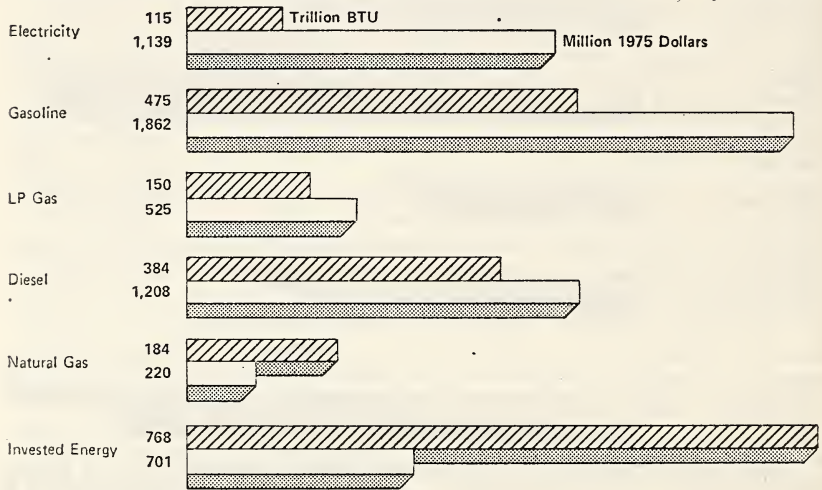
Farm production costs of \$75 billion in 1975 included approximately \$6 billion (almost 8 percent) for energy—\$5 billion for fuels and electricity and \$1 billion for energy invested in fertilizers and pesticides. Energy costs represent about 12 percent of current operating expenditures. Figures 2 and 3 illustrate the breakdown of energy use by fuel type and by function. The following are major characteristics of energy used in farm production:

Farmers consume about 1 quadrillion Btu (quad) of petroleum products in farm business operations—over two-thirds of the direct (fuels and electricity) energy use.

Indirect energy use in the manufacture of the most important agricultural chemicals—fertilizers (primarily natural gas as process heat and feedstock) and pesticides—totals an additional 0.8 quads.

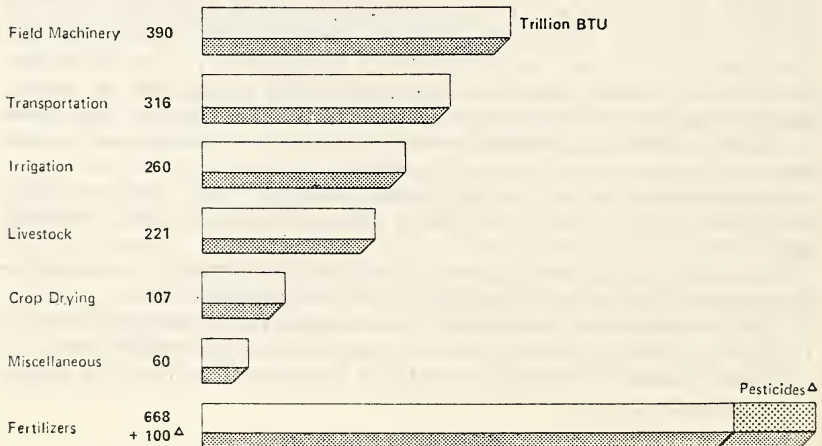
1977 ENERGY USE ON FARM *By Fuel Type and Cost—*

Figure 2



1977 ENERGY USE ON FARM *By Operation*

Figure 3



Energy invested in fertilizers far exceeds that used in any single direct farm production operation.

Of the direct uses, pumping irrigation water requires 20 percent of the total—more than any other farm production operation. Energy requirements for field machinery operations and for transportation account for the bulk of the remainder.

Corn production accounts for approximately a fourth of the total energy consumed in farm production.

The four major export crops—corn, wheat, cotton, and soybeans—consume over half the energy devoted to crop production.

One-half quad of energy is used in producing crops for export. The revenues generated are equivalent to the costs of 9 quads of imported oil.

Almost half the agricultural energy demand is concentrated in seven States—California, Illinois, Iowa, Kansas, Minnesota, Nebraska, and Texas.

Energy use beyond the farm gate

Energy plays an important role in activities occurring beyond the farm gate, as farm produce is of little utility in an urban society until it is processed, transported, and made available to the consumer. Food processors, marketers, and commercial eating establishments paid an estimated \$19.8 billion for 7 quads of energy (direct and indirect) in 1975—about 9 percent of total U.S. energy consumption.

Natural gas accounted for 36 percent of energy use beyond the farm gate. Process and space heat requirements made up almost half the food processing natural gas consumption.

Petroleum products, used for transportation, processing, and space heat, accounted for another 37 percent.

Over half the energy attributed to food processing is indirect—for example, the manufacture of cans and other containers.

Energy component of the consumer food bill

The American consumer has become increasingly aware of the effect of rising energy prices on utility bills and gasoline costs. Much less obvious are the secondary impacts of higher energy costs as reflected in the prices of food and other goods and services. When taken as an aggregate, this “embodied” energy often exceeds the quantity of energy used directly by the consumer.

In 1976, energy costs in the U.S. food system comprised an estimated 12 percent of the \$200 billion which consumers paid for food. In essence, a 10-percent increase in energy costs can translate into a 1-percent increase in the cost of food. Food products account for an average 16 percent of total consumer expenditures. However, the share can exceed 40 percent for lower income groups—those least able to adjust.

The energy share of food costs varies widely among commodity groups and according to the method of processing. American consumers spend \$11.5 billion annually on energy used directly in storage, preparation, and consumption of food in the home—almost half the total for the rest of the food system combined!

Other costs increasing more rapidly than energy

Energy costs in agriculture have been addressed thus far in two ways: (1) The rate of increase in prices, and (2) as a proportion of

total costs. The picture is not complete until the track records of other factors of production are compared.

If relative energy prices increase sharply, it is likely that considerable energy conservation and substitution would take place, even without contributions from the public sector. Existing technologies would be more readily adopted, and the private sector would have an incentive to invest dollars in developing new, energy-conserving technologies. However, there is little evidence to support such a trend in factor input prices in agricultural production. Farmers have generally experienced greater cost increases in nonenergy factors of production (labor, machinery, land) over the past decade, in spite of sharp energy price increases posted immediately following the 1973 embargo.

This should not be misconstrued as implying that farmers will not undertake energy management programs. More appropriately, it should be taken as evidence that farmers are not likely to substitute away from energy in their production input mix. However, a real incentive has existed to utilize energy and all other inputs more efficiently. Farm product prices have historically failed to keep pace with rising costs of production. Since the farmer has no control over product prices received, the result is shrinking profit margins. In the past, the farmer has been moderately successful in combating this cost-price squeeze through rapid increases in productivity. This has meant the more efficient utilization of some inputs, such as land and labor, usually through more intensive application of others, such as energy and fertilizer. Factor substitution has been driven by changing relative prices, with the more expensive inputs being replaced, once the risk factor has been perceived as acceptable.

PART III. WHAT IF? ENERGY SUPPLY SAFEGUARDS

Vulnerability to energy supply disruptions

The bottom line of this assessment is that impacts of anticipated energy price increases, although important, are not as important as the potential havoc in U.S. agriculture that a disruption in the availability of energy supplies could produce. On the supply side, an outlook of relative abundance has been constructed. However, some painful lessons may be drawn from the recent past—the oil embargo, the coal strike, and two consecutive hard winters. This Nation presently imports 45 percent of its oil needs—up from less than a third in 1973. It is clear that U.S. agriculture does not function in isolation and is dependent upon a world economy for essential inputs. Many external factors have the ability to impact heavily upon the supply of energy, within a short time frame.

Industry has coped with energy shortages up to a point through the development of energy management programs, expanded fuel storage facilities, and alternate fuel capabilities. The application of solar energy technologies is evident in its embryonic form. Industry efforts may be insufficient to handle extensive shortages. Several mechanisms exist which can provide safeguards to essential energy supplies for the agricultural system in the event of energy supply shortages.

Gasoline, 100 percent of current needs

The existing contingency gasoline allocation plan provides for 100 percent of current needs to agriculture—defined broadly to include most production agriculture, food processing, and distribution. This standby plan has been in place since 1974, under the authority of the Emergency Petroleum Allocation Act (EPAA), as revised by the Energy Policy and Conservation Act (EPCA). This authority extends into 1981. The DOE has been working to modify this plan in consultation with the USDA and others; and the revised plan will be released to the public in final form within the next few months.

Fuel oil/diesel

The standby allocation program for fuel oil, including diesel, extends to wholesale and retail outlets and large volume consumers. During a shortage period, 100 percent of base period use—the most recent 12 months—is to be allocated on a monthly basis. In addition, quantities are set aside at the State level for emergency distribution. This could be important to producers in agricultural regions—for example, during a wet spring in which farmers' diesel requirements are unusually high.

Natural gas and curtailment priorities

The recently passed NGPA is designed to improve substantially the protection of agricultural users from natural gas curtailments. Natural gas supply curtailment plans of interstate pipeline companies are subject to regulation by the Federal Energy Regulatory Commission (FERC) under the Natural Gas Act (15 U.S.C. 717). The recently enacted Natural Gas Policy Act of 1978 (NGPA) supersedes in certain respects such FERC curtailment regulatory authority. Section 401(c) of the NGPA requires the Secretary of Agriculture to determine the essential agricultural uses of natural gas, and to certify to the Secretary of Energy and FERC the natural gas requirements, expressed either as volumes or percentages of use, of persons, or classes thereof, for essential agricultural uses in order to meet the requirements of full food and fiber production.

Not later than 120 days after the date of enactment of the NGPA, the Secretary of Energy must prescribe and make effective a rule that, to the maximum extent practicable, no curtailment plan of an interstate pipeline may provide for curtailment of deliveries of natural gas for any essential agricultural use below the requirements as certified by the Secretary of Agriculture, unless such curtailment is necessary in order to meet the requirements of high-priority users—residential, essential services, and small-scale commercial.

The statute defines essential agricultural use to mean: “* * * any use of natural gas—

(a) for agricultural production, natural fiber production, natural fiber processing, food processing, food quality maintenance, irrigation pumping, crop drying; or

(b) as a process fuel or feedstock in the production of fertilizer, agricultural chemicals, animal feed, or food, which the Secretary of Agriculture determines is necessary for full food and fiber production.”

The USDA is in the process of implementing the agricultural priority section of the NGPA, with every intent of carrying out the certification within the 120-day time frame required in the act.

Section 401 of the NGPA is designed to deal with curtailments of relatively short duration. Should curtailments become severe, the President has the authority under title III of the NGPA to declare a natural gas emergency. The President may then authorize rerouting of natural gas to deficit areas and essential end users.

Mechanisms also exist for other energy forms. LP gas falls under EPAA and EPCA. The allocation system protects 100 percent of current requirements in agricultural markets. The allocation of electricity during times of shortages is the responsibility of State utility commissions.

Officials of DOE and FERC have the primary responsibility for seeing that objectives of these allocation mechanisms and curtailment safeguards are achieved.

The USDA, in general, provides assistance to DOE and acts as a spokesman for the agricultural community. Should any member of the agricultural community experience difficulty in obtaining needed energy supplies, the local office of the Agricultural Stabilization and Conservation Service, USDA, should be contacted for assistance.

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SOLAR ENERGY AND AGRICULTURAL SELF-SUFFICIENCY

(By Landy B. Altman, Acting Energy Program Manager, Science and Education
Administration, U.S. Department of Agriculture)

INTRODUCTION

The principal raw material of modern U.S. agriculture is fossil fuel according to Prof. David Pimental of Cornell University; not labor, not machinery, not seed, but fossil fuel. The fossil fuel energy system on which agricultural production depends is physically unsustainable because the resources involved are nonrenewable. Also, the scale of fossil fuel operations is so great that the capability of the ecological system to dispose of combustion wastes is questioned. The dependable production of food during the transition from fossil fuel sources to renewable energy sources poses a major challenge to U.S. agriculture.

This paper describes some of the research, development, and demonstration programs by the U.S. Department of Agriculture (USDA) on solar energy. Solar energy is a renewable energy source closely related to the major business of agriculture—using the Sun's energy to grow plants for food, fiber, and forest products. Widespread implementation of the outputs of solar energy programs can make agriculture more energy self-sufficient, provide jobs in rural areas, and reduce importation of oil.

Solar energy is a broad term. It includes heat from solar radiation, power from the wind, fuels and petrochemical substitutes from biomass, electricity from photovoltaic conversion of solar radiation, and electricity generated from ocean temperature differences. Although energy from photovoltaics and ocean thermal may find application in agriculture, the USDA currently is not involved in their development. A description of the USDA programs on the first three areas of solar energy are as follows:

HEAT FROM SOLAR RADIATION

About 20 percent of the energy used in agricultural production is for drying crops and heating greenhouses and for applications with livestock. Research managed by the Science and Education Administration (SEA) and supported by the Department of Energy (DOE), has established the technical feasibility of using solar radiation for these purposes. A total of 53 projects in 28 States was funded in fiscal year 1978 as part of the program now in its fourth year. Additional projects supported by State agricultural experiment stations are underway.

A major objective of present research is to provide cost-effective solar systems. Simpler and less expensive systems, "do-it-yourself" construction, and multiple uses of the solar collectors and energy

storages are being developed. An example of multiple use of a solar system is drying grain in the fall and heating a livestock building in winter. Another example is using a solar-heated greenhouse-type structure for starting tobacco plants in the spring, for curing tobacco in the summer, and for growing tomatoes or other crops in the fall and winter.

The Economics, Statistics, and Cooperatives Service analyzed the performance of eight of the experimental solar grain drying systems in 1977. They concluded that the costs of efficient solar systems are reasonably close to those of some propane gas systems now used. Financial incentives offered by Federal and State governments and further price increases for fuels could increase the economic feasibility of solar systems.

In October 1978 the Agricultural Stabilization and Conservation Service announced a pilot program on solar grain drying. Farm facility loans are offered in 26 counties in 9 States. Loan eligibility is designed so as to enhance the evaluation of the program and the equipment installed.

Another pilot program in which the findings of research on the application of solar energy for livestock production will be demonstrated on privately owned farms was initiated by SEA in September 1978, with funding from DOE. Cooperative Extension Services in from 5 to 10 States are being selected to conduct the demonstrations. We anticipate that 50 to 100 demonstrations can be supported with the funds provided.

SEA also is conducting research on solar-heated houses for low-income rural residents. In 1976 a low-cost solar house in which the attic was used as the collector and rock under the floor was used for heat storage was designed and tested. Two revised models of the house were built in 1978 near Clemson, S.C. The Appalachian Regional Commission built an additional 18 solar houses. National Homes, one of the Nation's largest manufacturers of prefabricated houses, built another to evaluate its performance for possible inclusion in their line of houses. All 21 houses will be tested this winter.

WIND

Before the widespread availability of central station electricity in rural areas of this country, wind energy was widely used for water pumping and battery charging. With DOE support, SEA is investigating wind energy for irrigation pumping, house heating, dairy operations, and other applications. Additional research is required on hardware development and on the management of rural electrical loads to take maximum advantage of wind availability and to minimize the onpeak use of backup power from central station electric systems.

One of the REA-financed rural electric cooperatives, the Blue Ridge Electric Membership Corp., Boone, N.C., is cooperating with DOE in the construction and use of an experimental, 300-foot-diameter wind turbine generator. The objective of the program is to develop durable and economical large wind systems for use by the electric utility industry.

Small wind systems such as can be used on farms have been selected for early commercialization by DOE. The USDA role has not been defined.

BIOMASS

The production and use of biomass as an energy source is of particular interest to agriculture because of its close relationship to food, fiber, and forest production. The development of biomass for energy and petrochemical substitutes will provide new markets for agricultural products and will make major contributions to rural energy self-sufficiency.

Biomass usually is converted to energy or chemicals by three processes—direct combustion including pyrolysis, anaerobic digestion, and fermentation. USDA's programs on biomass are discussed under these headings, plus the additional heading "environment."

Direct combustion.—The historic and still important method of using biomass is by direct combustion for heat. The biomass may be crop or forest residues or trees harvested for firewood. During a recent 15-month period, the Forest Service issued approximately 450,000 permits to cut wood in national forests for personal use. Forest industries now obtain about 45 percent of their required energy from their own residues. Direct combustion of biomass can also be a standby system for solar crop drying and for heating applications. LP-gas engines such as those used with irrigation pumps may be operated by gas obtained from the pyrolysis of biomass.

Anaerobic digestion.—Methane can be generated from animal wastes and, with somewhat more difficulty, from crop residues. Methane is a clean fuel which can be used in internal combustion engines or in heating applications. Generation of methane from manure provides a fuel, permits handling of a pollutant in an environmentally acceptable manner, and provides a protein-rich residue which can be fed to livestock. Equipment and operating costs are such that all three benefits probably are necessary for an economic system. SEA has 11 research projects underway that deal with the anaerobic digestion.

The Farmers Home Administration recently made a \$14 million loan to the city of Lamar, Colo., for a system that will convert manure from nearby feedlots to methane. The gas will be used as the primary fuel of the municipal powerplant, and natural gas will be used as the backup.

Fermentation.—Grains, sugarcane, sweet sorghum, and other crops may be fermented into alcohol which may be used alone or blended with gasoline to provide an automotive or tractor fuel. SEA had an active research program on this subject in the 1930's. The fiscal year 1979 budget provided funds to reactivate this program.

Public Law 95-113, the Food and Agriculture Act of 1977, authorized and directed the Secretary, USDA, to carry out pilot projects for the production and marketing of industrial hydrocarbons and alcohols derived from agricultural commodities and forest products. The Department is to guarantee loans up to \$15 million through the Commodity Credit Corporation for four projects. Approximately 28 proposals have been submitted to USDA, and awards are scheduled to be made by the end of the year.

Public Law 95-279 authorized the Secretary to permit and make incentive payments to producers to use all or any part of the acreage set aside or diverted from production of a surplus commodity for the production of commodities (other than the commodities for which the

acreage is being set aside) for conversion into industrial hydrocarbons and blending with gasoline or other fuels for use as a motor or industrial fuel. Information on crop species and production costs of energy crops is required for the implementation of this law. Research to develop this information is being planned.

Environment.—Biomass is a major energy source in many developing countries. Collection activities are so intense that hillsides often are denuded of vegetation and exposed to severe water and wind erosion. As we use biomass for energy in the United States, it is essential that we harvest only the biomass not required to protect the soil from erosion. Limited research in USDA is underway to develop a better understanding of the problem and to predict the conditions under which biomass may be safely removed.

AUTHORIZATION FOR SOLAR PROGRAMS

The involvement of USDA in solar energy programs was not specifically authorized by Congress until the passage of Public Law 95-113, the Food and Agriculture Act of 1977. Title XIV, subtitle H of this law provides authorizations for competitive grants, a research information system, model farms and demonstration projects, and regional solar energy research and development centers. Funds were not provided with the authorization, but it is clear that Congress expects USDA to be involved in encouraging and developing solar energy use for agricultural and nonagricultural purposes in rural America.

SUMMARY

A number of programs are planned or underway to assist agriculture in the transition from fossil to renewable energy sources:

- Research and development of agricultural applications of solar, wind, and biomass energy;

- Onfarm demonstrations of solar energy in livestock production;

- Demonstration of wind-generated electric power;

- Analysis of economic feasibility of solar energy for grain drying and other agricultural operations;

- Facilitation of the use of wood for heating;

- Loans for solar grain dryers and methane digestors;

- Guaranteed loans for pilot plants for the production and marketing of alcohol and industrial hydrocarbons;

- Use of setaside acreage for production of energy crops; and

- Environmental constraints on harvest of biomass for energy.

Widespread adoption of solar technologies will make agriculture more energy self-sufficient and thus better prepared for the post-petroleum era.

FAMILY LIVING

THE OUTLOOK FOR HOUSING

(By Robert J. Sheehan, associate chief economist, National Association of Home Builders)

Residential construction activity has been occurring at very high levels over the past 2 years. In 1977 there were 1.988 million units started and in 1978 we expect about the same level. These 2 years will be the fourth and fifth best years for new housing production in the history of the United States. There were only 3 better years—1971, 1972, and 1973—at 2.1, 2.4 and 2.1 million starts, respectively. Those years, however, were supported by high levels of Federal Government subsidized units. During each of these years there were about 400,000 new units that received subsidies either from the Department of HUD or the Farmers Home Administration. There were only about 100,000 subsidized new units in each of the last 2 years. Thus, 1977 and 1978 have had record years of production in terms of privately financed construction.

This year has surpassed the level expected by most forecasters and those who did call it may have been right for the wrong reasons. During 1977 the rate of inflation rose sharply, and along with it, interest rates. By September interest rates, especially for Federal Government securities, were high enough to provide strong competition for savings. The flow of savings into the thrift institutions (savings and loan associations and mutual savings banks) began to drop substantially. The thrifts are the principal source of mortgage funds in this country. The slowdown continued for several months into May 1978. In each of these months net new savings in the thrifts were about 50 percent under the same month in the previous year. These institutions were coming to the point where they would not have money to lend for new mortgages at the record levels that had been occurring. Also, one must keep in mind that dramatic price increases in both new and existing homes had been continuing. This alone would require substantial new funds just to support the same unit level of activity. A crunch was expected with a sharp downturn in new housing starts.

Then in late May the money managers of the United States stepped in and made commercial banks and the thrifts more competitive for savings. The announcement caught the financial community by surprise. These money managers—the Federal Reserve Board (regulates commercial banks) and the Federal Home Loan Bank Board (regulates the savings and loan industry)—approved two new money market instruments. One was designed to capture short-term savings and the other long term. The long-term instrument was an 8-year certificate of deposit which could carry an 8-percent interest rate. It was the short-term instrument that had the most pronounced effect. This was a 6-month certificate of deposit whose rate was tied to the

yields on 6-month U.S. Treasury bills. These 6-month bills are one instrument that the Federal Government uses to finance its operations and debt. The 6-month bills, combined with the Government's 3-month bills, become a leading indicator of the direction of interest rates in general. When their yields rise, especially as a result of the high level of the Federal deficit, investors are attracted to them, they take their money out of commercial banks and thrifts which had been limited in the interest they could pay. The new change now made commercial banks and thrifts competitive for funds. In the case of the thrifts they also could add one quarter of 1 percent above that paid by the U.S. Treasury Department and commercial banks. This is similar to the advantages that they have on their other types of accounts.

During June—the first month they were permitted to be issued—the flow of new savings into S. & L.'s turned around and has continued that way ever since. It should be noted that the new flows were still not at comparable levels to previous periods but they were substantial. The expected downturn did not occur. The seasonally adjusted annual rate of housing starts has stayed over the 2-million level.

In spite of this change all is not positive for the housing market. The general rate of inflation, as measured by the Consumer Price Index, has run at double-digit levels several times this year and will end up at around 9 percent. This compares to 6.6 percent in 1977 and 4.8 percent in 1976. New home prices have been increasing at a 12-14 percent rate over the past 2 years. Building materials prices, which used to change generally about once a year, are now changing so often that builders have difficulty obtaining quotes. Land development regulations and growth moratoria are pushing up land prices. And mortgage interest rates are pushing over 10 percent in a number of markets.

In prior economic cycles housing led the economy into recession when mortgage market funds dried up. It wasn't mortgage interest rates that stopped housing sales; it was the lack of loanable funds. The new money market certificates have changed this—at least temporarily. Mortgage money also has been more available because of other more active sources of funds. The Federal Home Loan Bank Board (FHLBB) can make loans to its member institutions and it has done so at very high levels this year. They are expected to increase the outstanding level of these loans by \$14 billion in 1978. Also the secondary markets—where mortgages are purchased from lenders who, in turn, can lend these proceeds out again—have increased their importance. The principal operator in this market is the Federal National Mortgage Association (Fannie Mae). In 1978 they will make net purchases of \$12 billion in mortgages. Both the FHLBB and Fannie Mae obtain the funds they use for the loans and mortgage purchases from the general capital markets. This means they draw in new money to the residential mortgage markets. In turn we have insulation for the availability of mortgage money. Further we will now have a new test of the housing market—effects of the price of money and housing costs.

At some point housing costs and mortgage interest rates will force substantial numbers of families out of the housing market. Households, for the past few years, have been willing to buy new homes and spend more of their income on housing. At what point will they

give up? This is not known precisely, but we know lenders will become more careful. Hence, the result will be that buyers will decide to postpone their purchases—and this trend will continue into 1979.

The mortgage supply problem is not behind us. At least 17 States have usury laws which essentially limit mortgage interest rates to 10 percent or less. With the dramatic tightening in monetary policy, evidenced by the recent actions of the Federal Reserve Board and the administration to support the dollar in foreign markets, it is clear that the mortgage rate will rise above 10 percent. Lenders will be unwilling to seek savings that will essentially cost them money. Thus, they will slowdown their willingness to accept the new money market certificates and that means that less mortgage money will be available in these States with usury laws.

Certainly some of these 17 States will raise their ceilings, but this takes time. Raising the usury ceilings becomes an emotional issue and by the time they are raised the crunch is usually over. They only tend to help raise the level for the next tight money period.

This forms the framework for the NAHB forecast. It is based on certain assumptions. We anticipate that short-term interest rates will peak early in the first quarter of 1979. This would mean that Treasury bill yields will go over 10 percent and the prime rate will reach the 11-12 percent range. They would then decline over the rest of the year. The secondary mortgage markets and the Federal Home Loan Board advances will still be strong. The administration's inflation policy will be somewhat effective and will drop inflation down to the 7-percent level for the year. Overall economic growth will be about 1.5-1.75 percent for the year in real terms as measured by GNP. This will be less than half the 1978 rate. Personal income will rise at about a 9-percent rate, down markedly from the 11.3 percent of this year. Unemployment should rise moderately to the 6.5- to 6.6-percent level.

These assumptions produce a housing starts forecast of 1.65 million units for 1979, down 15 percent from this year. The downturn would be shared proportionately by the single and multifamily sectors. Single family starts are expected to drop to 1.150 million units, off 220,000 units from the 1.370 million units produced this year. Multifamily starts are predicted to decline to 500,000 units, down 90,000 units from the expected 590,000 starts for 1978.

Uncertainty is the best description for this forecast. The recent sharp rise in interest rates may lead to a longer period of high rates and further dampen investor and consumer confidence. There is now a 60 to 70 percent chance for a recession for next year. If monetary policy does not loosen up after the first quarter of 1979 and economic confidence wanes even further, the forecast could change to the 1.50- to 1.55-million level.

I don't mean to bring you a picture of doom and gloom—but forewarned is forearmed and the outlook today is less than rosy.

I was asked to comment on the future design of homes as they will be affected by energy consumption, cost of materials, smaller family sizes and changing life styles.

Presently we are working on a 10-year housing starts forecast. Preliminary results show that we can expect a high level of production for the 1979-88 period. Starts should average 1.9 million units per year

over the period with single family units taking a 70-percent share. The market will continue to be dominated by the 25-34-year-old households who were born in the post-World War II baby boom.

To date the housing market has not been visibly affected by smaller family sizes. Units have become larger with the median size increasing to 1,610 square feet in 1977 from 1,590 square feet in 1972. Higher incomes and greater demand for space have led to this pattern. This trend may be reversed now by change from another sector—tax laws.

The 1978 tax bill now permits the exemption of up to \$100,000 of the profit on the sales of homes occupied by owners over 55 years of age. Owners can take advantage of this change in the tax law once in their lifetime. These households—who are likely to be “empty nesters” (without children)—have not been able to take advantage of the sharp rise in their property values. If they had a desire to move into a smaller unit the tax laws constrained them. Moving into a smaller unit means paying a smaller price, plus having to pay capital gains taxes. Now that they are freed from this restriction, more of them will move. After all, it's practically a windfall from heaven to be able to save all the capital gains tax money. And, at 55 or over, that's a healthy chunk toward retirement plans. Smaller units will benefit, especially condominiums and townhouses. It is too early to determine the magnitude of this change, both in demand for smaller units and the amount of space required. But, believe me, the change will happen.

Concern over energy consumption is primarily manifesting itself into the greater use of insulation and passive solar collectors. The placing of new residential structures on lots is becoming more of a science, based not only on drainage, sewage, water sources, et cetera, but also on its direction toward the Sun. Passive solar collectors, which in current technology are primarily windows, are reliant on their position to the Sun to measure their effectiveness. Technology on solar collectors to provide energy for heating and cooling and other uses is still in its infancy. Very little equipment is economically viable. A continued high level of migration toward the Sun Belt States will keep up the interest and investment in solar energy.

Finally, there is little that can be said about the effects of the higher costs of building materials. From recent trends there is no evidence that the basic materials used in housing production will change. All prices are rising together with only short-term lags between competing materials. The only major change in the last few years has occurred in exterior sheathing materials. Previously sheathings were primarily made of either plywood or wood byproduct composition boards. Greater needs for insulation in walls has led to the use of insulating materials for sheathing. Styrofoam and other petrochemical-based materials have been the primary substitute materials. Changes will no doubt occur but they are not now evident.

STATUS OF HOUSING IN NONMETROPOLITAN AREAS

(By Ronald Bird, U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service, Economic Development Division)

I am pleased to be asked to speak to you about the housing situation in nonmetropolitan areas. I hope in the few minutes allocated to me that I will be able to point out some of the unique and relevant characteristics of nonmetro housing, the changes that have occurred, and some of the problems yet to be solved if all rural families are to live in adequate housing. The statistics I am citing today on the current housing situation are largely based on the annual housing surveys conducted by the Bureau of the Census in cooperation with the Department of Housing and Urban Development. These surveys are completed in the fall of each year. The most recent data available are those collected in 1976.

In talking about housing, I alert you that housing conditions change very slowly. Most of the homes we occupy today were built several years ago. As a result, overall housing conditions are altered very little by repairs and new construction in the course of a single year. For example, the number of homes built in 1977 increased the supply of houses by 2 percent. Because of such slow changes, I believe that the data from the 1976 Annual Housing Survey fairly accurately reflects the housing conditions that exist today.

A basic characteristic of housing in the United States is that housing construction, renovations, and repairs are essentially private sector activities. Governmental help has been mainly in a form of making credit more readily available through insured or guaranteed loans to private citizens or groups to improve their housing. Most of the housing, however, is built or improved by private citizens contacting their own builders, negotiating on their own for credit, and setting up their own repayment schedule with lenders. Hence, the availability of private credit plays a major role in determining how many homes are built or improved in the United States.

ROLE OF GOVERNMENT PROGRAMS

Governmental help has and is playing an important role in helping to improve loan terms, in establishing loan criteria, and in helping to direct funds to the more needy. The extent of this help has varied from decade to decade. During the 1950's, the Government helped with credit in the construction of about 24 percent of the units built in nonmetro areas, during the 1960's about 18 percent; and during the 1970's about 27 percent.

Housing loans made by banks and other lending institutions but insured or guaranteed by the Federal Housing Administration (FHA) or the Veterans Administration was the most common type of Federal

help to nonmetro households during the 1950's and 1960's. The Farmers Home Administration (FmHA) became the major insurer during the 1970's.

The role of Farmers Home Administration has changed markedly in the past 30 years. During the 1950's, when Farmers Home could make loans only to farmers to improve their housing, this agency helped in the construction of about 2,000 units annually. During the 1960's, their program was expanded to include rural nonfarm households in the open country and places and towns of less than 5,500 population. As a result their financial assistance helped in the construction of about 16,000 homes annually. And during the 1970's, with increased lending authority and the adoption of the interest credit subsidies, they're helping in the construction of about 75,000 homes annually. Their current programs include many types of loans, such as ownership loans, loans to construct rental housing, farm labor housing loans, and repair loans.

PROGRESS IN IMPROVING HOUSING

An important attribute of the housing construction industry in the United States is that housing is built by many small contractors rather than a few large ones. The 1972 Census of Construction Industries showed 90,000 general contractors built \$23.2 billion worth of residential construction that year. Total employment in these industries was about 470,000.

Despite the many small firms, the housing industry has performed remarkably well over the past 30 years. One indication of this is that the industry has built housing faster than new households have been formed since World War II. This is not meant to suggest a surplus now exists but rather it allowed the abandonment of older, dilapidated dwellings. The only other decades before World War II in which housing starts exceeded new household formations were the 1890's and the 1920's.

The building boom we have experienced since World War II has resulted in a continuous rise in the quality of housing as the poorer units have been abandoned. In 1950, for example, 58 percent of the occupied units in nonmetro areas lacked complete plumbing and 19 percent were crowded (more than one person per room). By the fall of 1976, the percentage of units lacking complete plumbing fell to 5 percent and the percentage of units crowded was reduced to 5 percent.

The large number of new units added to the housing stock has been a major factor in accounting for this improvement. During the 1950's about 420,000 units were built annually in nonmetro areas, this number increased to 475,000 annually during the 1960's, and then expanded rapidly to 650,000 units during the 1970's. In 1978, we estimate production will be about 700,000 units or about 14 percent higher than last year.

While the number of new units added each year is small compared with the existing housing stock, the cumulative number of new homes added since 1950 totaled more than 14 million units and represents over 53 percent of the housing stock in nonmetro areas today.

During the 1950's and 1960's, the housing stock increased more rapidly in the metropolitan than in the nonmetropolitan areas. But during the 1970's, the housing stock and households have increased more rapidly in the nonmetropolitan sector.

MOBILE HOMES

The surge in mobile home construction in nonmetropolitan areas has played an important role in expanding the housing stock. During the 1970's, one out of four new homes in nonmetropolitan areas was a mobile home, compared with 1 in 12 in the metropolitan areas. This year we expect that about one out of every five new homes in nonmetro areas will be a mobile home.

Mobile homes are providing housing for many of the low-income households in nonmetro areas. Of the 1.5 million mobile homes in nonmetro areas bought since 1970, one-half of the purchasers had incomes less than \$10,000 a year. Among conventional home buyers only one-fourth had incomes this low.

A major reason for the popularity of the mobile home is their price. The average price of a mobile home purchased in 1977 was \$14,000 compared with \$37,000 for the conventional dwelling. These prices do not include the price of the lot; but for the mobile home the cost of the furniture is included. The difference in the cost per square foot of living space is large; \$12.52 for the mobile home and \$25.10 for the conventional built dwelling. With these price differentials, mobile homes have been of increasing importance as a means of providing low-cost housing.

CURRENT HOUSING SITUATION

Although there has been a vast improvement in housing conditions in nonmetro areas in recent years, housing conditions by almost any measure of adequacy are poorer in nonmetro than metro areas. In 1976, 44 percent of the 5.1 million homes that lacked complete plumbing and/or were crowded were located in nonmetro areas, but these areas contained only 32 percent of the households. Of the 1.2 million homes that lacked a complete kitchen, 59 percent were in nonmetro areas in 1976. Values and rents are only three-fourths as high in nonmetro as they are in metro areas.

The incidence of bad housing (lacking plumbing and/or crowded) is closely related to household incomes, and is highest among the very poor in nonmetro areas. For example, 41 percent of the bad housing was occupied by households with incomes of less than \$5,000 in 1976, but households with incomes this low represented only 24 percent of the total households. Even among higher income groups, the incidence of bad housing was relatively high in nonmetro areas. Households who had incomes \$10,000 or more occupied 31 percent of the bad housing.

Although there has been a rapid improvement in housing conditions since 1970, not all groups have shared equitably in this improvement. Groups for which progress has lagged include blacks, the elderly, and the single person households. Blacks occupied 27 percent of the housing that lacked complete plumbing and/or was crowded in nonmetro areas in 1976, up from 20 percent in 1970. But blacks occupied only 7 percent of all nonmetro housing in both 1970 and 1976.

Among the elderly or the single person household, crowding is not a problem. But based upon the plumbing criteria—housing that lacks complete plumbing—a pattern similar to that shown for the blacks was manifest. The elderly occupied 35 percent of the units that lacked

complete plumbing in 1976 compared with 32 percent in 1970. Single person households—many of whom are elderly—occupied 36 percent of the housing that lacked complete plumbing in 1976, well above the 26 percent in 1970. The rapid increase in the young single person household has contributed to the greater prominence of poor housing among single person households.

Reasons for the lag in the improvement in housing among the blacks, elderly, and single households are many. The relatively low level of income among these groups is no doubt a major factor. But their limited access to credit, again partly due to their limited income, is of considerable importance. An analysis of the 1976 annual housing survey data shows only 3 percent of all rural households having conventional mortgages were black, but among those mortgages insured by FHA, 8 percent were black households, compared with 11 percent of those financed with assistance from FmHA. Governmental programs thus have played a significant role in helping blacks improve the quality of their housing.

FARMWORKER HOUSING

I would be remiss in my presentation today if I did not say something about farmworker housing. A survey of farmworker housing was included in the annual hired farm working force survey conducted for ESCS by the Bureau of Census in 1975. These data show there were 2.6 million farmworkers residing in 2 million homes that year. Their farmwork ranged from a few days to full-time farmwork. About two-thirds worked less than 150 days on the farm.

The survey data show little difference in the size of the house, adequacy of plumbing, crowding, source of water, or types of sewage disposal in the homes occupied by either short-term or long-term farmworkers as compared with the farm operators or rural nonfarm residents.¹

RURAL-URBAN CREDIT DIFFERENCES

For most families buying a home, it is the largest single purchase they ever make. And for most home buyers, a large part of the home purchase price is met by placing a long-term, amortized mortgage on their property. When monetary restraints exist, and mortgage money is relatively scarce, higher interest rates, larger downpayments, and shorter terms to maturity are imposed; home sales decline and home builders cut back on construction. In 1969 and again in 1974, serious slumps in home sales and construction have been attributed by many to the "credit crunch".

While changes in monetary policy impact periodically and nationally on the supply and terms of home mortgage funds, there has existed a chronic deficiency of home mortgage funds in the more rural sections of the nonmetro areas. This may partly account for the relatively large number of high income nonmetro residents living in inadequate housing. This rural credit problem stems from the fact that a small local bank is the only accessible source of credit in many rural

¹ The survey of farmworker housing included migrant farmworkers, but the number in the sample was too small to permit analysis of the condition of migrant worker housing only.

nonmetro counties. Such banks rely primarily on local deposits from which they try to meet credit needs of a vast array of borrowers. Under such circumstances banks invest only a limited amount of their funds in long-term housing loans, usually about 20 percent.

Nationally, savings and loan associations make about half of all housing loans for single family homes and offer somewhat more favorable credit terms than do many other lenders. However, this source of credit is not yet available to many rural people. Of the 865 most rural counties in the nonmetro areas, 805 do not have an S&L operating within their borders.

Farmers Home Administration is designed to help close this gap in home mortgage credit in designated rural areas, but FmHA activities would have to be greatly expanded in the more rural counties if housing credit available per capita were to be equalized between the larger metropolitan counties and the more rural counties in the nonmetropolitan area. In 1975, outstanding housing loans of commercial banks, savings and loan associations, and the Farmers Home Administration averaged \$498 per capita in the most rural counties of the nonmetro areas as compared with \$1,490 per capita in the larger metropolitan counties. Much of this difference can be credited to the lack of savings and loan association loans in many rural nonmetro counties. Outstanding S&L's housing loans on single family homes averaged only \$49 per capita in the most rural counties of nonmetro areas as compared with \$1,213 in the larger metropolitan counties. Bank lending showed a comparatively smaller difference—\$280 in the rural counties and \$371 in the larger metropolitan counties. Some of this difference is due to lower incomes and lower prices of housing in nonmetro as compared with metro areas.

Farmers Home Administration loans are covering part of this rural credit gap. Outstanding FmHA loans per capita on single-family units were \$169 in the most rural counties and only \$7 in the larger metropolitan counties in 1975. In the rural counties, FmHA held 34 percent of the housing loans.

A gradual expansion of S&L's lending activities coupled with an expanding lending program of FmHA to low and moderate income families is bringing about some improvement. However, there still remains a long way to go before home mortgage credit is as accessible and on the same terms in the more rural parts of nonmetro areas as it is in the metropolitan areas.

RISE IN HOUSING COSTS

One of the major deterrents to housing improvement since 1970 has been the rapid rise in the cost of housing as compared with increases in household incomes.

In constant dollars, housing prices have increased more rapidly in nonmetro than in metro areas since 1970. By 1976, housing values in nonmetro areas increased 47 percent as compared with 27 percent increase in metro areas. Offsetting this difference, however, was incomes. They rose more rapidly in nonmetro areas than in metro areas—7 percent as compared to 1 percent.

Rents have not risen as rapidly as housing prices. The increase in rents based on constant dollars was about the same in metro and

nonmetro areas—about 8 percent from 1970 to 1976. Unfortunately, the real incomes of renters decreased during this time period—about 8 percent in nonmetro areas and 13 percent in metro areas. The reason for this decrease is probably due to a shift of more low income households into the rental category—mainly due to the increase of the young households.

IMPACT OF RISING ENERGY COSTS

Recent events in terms of energy shortages have created a whole new problem in the area of housing. Rents and mortgage payments are becoming a smaller part of outlays for shelter. Heating, cooling, water, waste disposal, taxes, and a multitude of other costs are rising rapidly. Current programs exist to help a household gain access to suitable housing, but the occupants now faced greater difficulties in meeting these other bills. In 1976, these costs were one third as high as the mortgage payments. Unfortunately, these shelter costs are rising rapidly and while all households are being affected, those with limited incomes are particularly handicapped.

Efforts to conserve energy through weatherization of housing and developing alternative energy sources such as solar energy are means being used to minimize the impact of rising energy costs. Despite these efforts the rising energy costs pose a problem of growing importance in the Nation's efforts to provide more adequate housing.

HOUSING DIFFERENCE IN NONMETRO AREAS

In seeking programs to help improve housing in nonmetro areas, we need to recognize that housing differs from that in metropolitan areas in several important respects. Some of these are as follows: (1) Single unit structures are more prevalent in nonmetro than in metro areas. In 1976, 88 percent of the occupied units in nonmetro areas were single units compared with 65 percent in metro areas; (2) single unit structures are also increasing in popularity in rural areas rising from 77 percent in 1970 to 88 percent in 1976; (3) owner occupancy is more common in nonmetro than metro areas, and (4) rental units are more apt to be a single unit structure in nonmetro than in metro areas. In 1976, almost two-thirds of all nonmetro rentals were single unit structures as compared with one-fourth in the metropolitan areas. In addition, 1 of 12 of the renters paid no cash rent in nonmetro areas as compared with 1 in a 100 in metro areas.

CHANGING HOUSEHOLD COMPOSITION

Furthermore, we need to recognize an important change in household composition that has occurred since 1970. This is the rapid increase in single person households. The number of single person households rose 37 percent in nonmetro areas and 32 percent in metro areas. Households with two or more persons increased 17 percent in nonmetro areas and 11 percent in metro areas. Rather surprising to me was the fact that in nonmetro areas the increase in single person households was more rapid among renters, but in metro areas the increase was more rapid among owner occupants.

SUMMARY

I have cited many numbers today and in general they show we have never been as well housed in rural America as we are today. We still have our problem areas. In solving them, the data suggest future emphasis should be made to foster the growth and extension of alternative sources of credit in the most rural counties of our Nation so they have equal opportunities to improve their housing. Among certain groups of our population such as the blacks, the elderly and single person households, ways need to be found to help them improve their housing. In some instances, this improvement may be fostered by helping them to increase their incomes, but in many situations the answer lies in helping them find ways to obtain lower cost housing. Shelter costs other than those needed to purchase or rent a home are also rising rapidly. Controlling these costs and seeking ways to lower or modify them may be our biggest problem of the future. In spite of these problems, they can be solved if we follow the suggestion of Abraham Lincoln when he said—"Let not him who is houseless pull down the house of another, but let him work diligently and build one for himself, thus by example, assuring that his own shall be safe from violence when built."

FARMERS HOME ADMINISTRATION RURAL HOUSING PROGRAMS

(By L. D. Elwell, Assistant Administrator, Rural Housing, USDA)

Thank you for the opportunity of meeting with you to discuss the Farmers Home Administration's rural housing programs. Housing is a matter of common concern as I know that many of you are actively working to help families in rural communities solve their different problems, including their housing problems. I am hopeful that my comments plus what is said during the following question and answer period will provide information that will help us all work together toward the common goal of helping improve the housing conditions in rural areas.

As a nation, several years ago we adopted as our housing goal to provide for every family, the young and old, the urban and rural, an opportunity to have a decent home. Considerable progress has been made toward accomplishing this goal in the past quarter century but much remains to be done, particularly for the low-income families in rural areas. Statistics sometimes may lure us into thinking that the problem is solved; however, those of us that work in rural areas know that is not the situation.

One-third of our population lives in rural America. This one-third of our population, however, has 42 percent of the Nation's substandard housing and 40 percent of the Nation's poverty. Many people are aware of the poor housing in the slums or our large cities, but few realize, however, how deeply this blight also reaches into the open country and the small towns.

In our opinion, one of the most important things needed to resolve rural housing problems is a delivery system that puts the housing credit out where the assistance is needed. FmHA has such a delivery system. We have 46 State offices and approximately 1,800 county offices serving every county or parish in the 50 States plus the Pacific Trust Territory, Guam, Puerto Rico, and the Virgin Islands. Each county office is staffed with personnel who live and work in the local communities and become acquainted with the local leaders and others who work toward the common goal of helping families improve their housing. In dealing with the problems of low-income families, we believe it is essential to have county office personnel who can talk with low-income families across the table to be sure that they understand the problems and then can guide the family toward a satisfactory solution. Families in this income bracket cannot or often are hesitant to do business by telephone, long-distance commuting, or by mail. They need to be able to talk to someone to explain their problem. FmHA's delivery system is designed to provide this needed face-to-face contact.

FmHA has a number of rural housing programs or "tools" that can be used to improve a family's housing condition. FmHA should not be thought of as a banker or lender. We are an agency with special purposes and authorizations. FmHA is a lender of last resort or secondary lender. Translated in laymen's terms, this means that we serve only those who are unable to obtain the needed housing loan from a private lender. Many people immediately think of persons who have bad credit ratings; however, this is not the case. Our experience indicates that many rural areas are not served by private lenders providing housing credit. Furthermore, there are many, many families who simply do not have the downpayment or who cannot afford the loan terms required by private lenders. With this brief background information, let's look at some of the FmHA housing programs and see how they can be used to provide this needed assistance in rural areas.

SECTION 502 RH LOANS

The section 502 loan is one that can be made to a family to buy, build, or improve a modest home of their own. It is our largest volume program with more than \$3 billion insured and guaranteed lending authority available for 1979 fiscal year. Over 800,000 active borrowers owing an outstanding balance of over \$10 billion. This loan can be used to buy the site, build the housing, and provide the related facilities. Eligible applicants are those who are unable to obtain a loan from a private credit source, who have adjusted incomes of \$15,600 or less, but who have income sufficient to repay the FmHA loan. We presently serve both low- and moderate-income families. The moderate-income families have adjusted incomes of between \$11,200 and \$15,600. These families currently pay 8½ percent interest and the loan can be amortized over a period of up to 33 years. Low-income families are those having adjusted incomes of \$11,200 or less, and they receive approximately 60 percent of our loans. They are eligible for interest credit assistance, which is a subsidy paid by FmHA to lower the effective interest rate from 8½ percent to as low as 1 percent. The family pays 20 percent of their income for principle, interest, taxes, and insurance before the subsidy is granted. The average effective interest paid by the families in this income category is about 2.9 percent. We do not have fiscal 1978 figures available to give you an idea of average size of loan and house; however, at the end of fiscal 1977, the average size house contained 1,057 square feet of living area, the average loan was \$25,067 and the average family size was 3.4 persons per family.

Attached to your copy of my remarks are several tables which are taken from the 1976 annual housing surveys prepared by Economics, Statistics, and Cooperatives Service. These tables provide information about FmHA borrowers for the years 1974-76 and are compared to loans made prior to 1974. These tables also compare loans made by FmHA with those made by FHA, VA, and conventional lenders. A short summary of the tables for our section 502 borrowers is as follows:

The median income for FmHA borrowers for this period was \$10,433 as compared with \$15,679 for borrowers receiving loans made by conventional lenders. This median income is less than for borrowers receiving loans made prior to 1974.

The median age of FmHA borrowers is 29.7 years.

The percentage of loans made to black families decreased during the 1974-76 period and Administrator Gordon Cavanaugh has pledged to take every action to change this trend.

About 43 percent of the houses financed by FmHA are on public sewer and about 69 percent of the houses are on public water systems.

The predominant source of heat is electricity and a more current figure shows almost 80 percent to be using this type of heat. Rising energy costs is probably the biggest single problem being faced by our borrowers.

Ninety-three percent of FmHA borrowers rated their homes as excellent or good.

There are many reasons for FmHA borrowers seeking housing assistance with the desire to own a residence and the need for a larger home being the two most important.

The above describes our section 502 insured program; however, we have just implemented a guaranteed rural housing program for above moderate incomes. The FmHA uses different terminology than most when we talk about "insured" and "guaranteed" loans. The "insured" loan is a direct loan made by the FmHA and a "guaranteed" loan is made by another lender with an FmHA guarantee. This includes families with adjusted incomes of between \$15,600 and \$20,000. These loans will be made by private lenders with FmHA guaranteeing 90 percent of the amount loaned. The interest rate will be determined on a negotiated basis between the lender and the applicant; however, the interest rate cannot exceed the rate charged on other similar loans in the area. The house must be modest in size, design, and cost, but may be somewhat larger and contain amenities not financed under our insured program. There is no dollar limit as to the amount of house; however, above moderate housing is generally limited to housing containing 1,400 square feet or less of living area. This above moderate program will permit us to provide needed assistance in many rural communities where lenders are not able or willing to make a loan without a guarantee. Applicants will be required to make a down-payment of 3 percent of the first \$25,000 and 5 percent of any amount above that. The loans can be repaid over a period of up to 33 years.

The new housing bill just passed by the Congress, S. 3084, expands the section 502 loan program and provides another tool which will enable us to help the very low-income family acquire adequate housing. The act provides for a homeownership assistance program (HOAP). Under this authority, a family will pay 25 percent of their income toward (1) principle, (2) interest, (3) taxes, (4) insurance, (5) utilities, and (6) maintenance. The Government will make up the balance as a subsidy payment. The program will be limited to areas where rental housing is not feasible as an alternative. Families will be required to have an income at least sufficient enough to pay the daily maintenance costs. This authority is new and has not yet been implemented. We hope to have it operative in February or March of next year.

These programs will enable FmHA to assist families in a wide range of incomes ranging from above moderate limits of \$20,000 down to very low-income families receiving HOAP. The law also provides that

the Government will recover any subsidy granted should the house be sold or the borrower cease to occupy it.

SECTION 504 LOANS AND GRANTS

This loan and grant program is one designed to assist very low-income owner-occupants in making repairs to their home to correct health and safety hazards. There is \$5,000 limit of total assistance to any family and the grants are available only to persons 62 years of age or older. The most predominant use of this program is to bring running water and install bathrooms in homes. Many of us probably feel that in this year, 1978, there are few homes without running water or a bathroom. The opposite is true. Many of the elderly and otherwise disadvantaged families are living in homes that are totally inadequate for human habitation. The loans have been averaging about \$2,500 and the average grant has been about the same.

SECTION 515 RURAL RENTAL HOUSING PROGRAM

After the section 502 homeownership program, the section 515 rental program is the largest volume program. Rural rental loans can be made to individuals, profit, nonprofit corporations, limited partnerships and public bodies to provide rental housing for low- and moderate-income families in rural areas. This program has grown tremendously in the past several years. For example, in fiscal 1972, we loaned about \$40 million; whereas in fiscal 1979, we have available \$868 million. The program initially provided housing only for the elderly; however, we now have the legal authority and are making every effort to provide rental housing to low-income families as well.

In many communities, concerned citizens, such as you, have seen the need for rental housing, have formed a nonprofit corporation, and have borrowed money from the FmHA to provide rental units in their own community for their neighbors and friends, both young and senior citizens. For elderly, the units have generally been one- or two-bedroom apartments designed to fit the individual family's needs. The projects are located close to shopping facilities and often a small recreation or community room is provided within the project for use by the occupants. Projects range in size from 150 units down to a single duplex.

The section 515 rental program has been used in tandem with the HUD section 8 deep subsidy program for several years to provide rental housing for very low-income families. Approximately 25,000 units have been provided in this manner during the past 2½ years. FmHA also recently implemented its own rental assistance program and presently has 23,000 units with this form of deep subsidy.

SECTION 523 SELF-HELP TECHNICAL ASSISTANCE GRANT

In many parts of the country, families who cannot afford a home built by the contract method are willing to join together and build their homes with their own labor. The groups usually consist of six to eight families and with the guidance of a construction supervisor, they build their homes. This self-help effort is a sacrifice on the part of the family; however, they acquire an immediate sweat equity plus a

pride of ownership in their home. The self-help technical assistance grant is used to fund the organization which provides the guidance needed in forming these groups, guiding the families as to the loan requirements, and providing the supervision during the construction. There are currently 52 active grantees in 18 States helping families to build houses under this method. Each participating family receives a section 502 loan to buy the material and to contract for any skilled work that must be obtained, such as plumbing or electrical. The grantees are usually nonprofit corporations; however, a few public bodies such as housing authorities have participated in the program.

SECTION 524 AND SECTION 523 RURAL HOUSING SITE LOANS

For communities without available building sites, a site loan can be made to a nonprofit corporation or public body to buy land and install the streets and utilities necessary to develop a desirable subdivision. The developed sites can be for self-help housing and for other low- and moderate-income families. We are constantly reminded that sites are in short supply in the rural areas. This is one authority that can be used to alleviate this problem.

SECTION 514 AND SECTION 516 FARM LABOR HOUSING LOAN AND GRANT PROGRAM

FmHA can make loans and grants to public bodies and nonprofit corporations to provide housing for domestic farmworkers. A domestic farmworker is a person who makes a substantial portion of his or her income from work on farms. This may be for migrant or for permanent farmworkers in an area. There is a special need in certain parts of the country for this type of housing and our current 1979 fiscal year budget reflects increased funding to meet these needs.

Attached is a table that also reflects the fiscal year 1979 budget levels for our rural housing program. Some of you here today probably feel that these programs could be used in your area and are asking the question how do we take advantage of these programs? The best advice is for you to contact our local county supervisor serving the area in which you are interested, who will be glad to discuss the needs that you have and the various programs of FmHA that may be of help.

FmHA needs help in providing outreach to families who need to know about our programs. Low-income families and minorities especially need to be informed of the assistance that is available. With the assistance of people like you, we can help make rural life in small cities, towns, and villages sufficiently attractive to make it a place to move "to" rather than "from."

Thank you again for this opportunity and I will be glad to answer any questions during the question and answer period.

FARMERS HOME ADMINISTRATION

Budget levels for fiscal 1979 rural housing program

	Total (in thousands)
RHIF:	
Low- to moderate-income housing-----	\$2, 867, 000
Above moderate-income (guaranteed)-----	500, 000
Rural housing site development-----	3, 000
Rural rental housing-----	868, 000
Very low-income repair loans-----	0, 000
Farm labor housing loans-----	38, 000
Total, RIHF-----	4, 300, 000
Rural rental assistance-----	425, 000
DIF:	
Self-help land development fund-----	1, 725
Farm labor housing grants-----	33, 000
Mutual and self-help grants-----	28, 000
Very low-income housing repair-----	19, 000
Sec. 525 grants-----	2, 500
Total-----	85, 225

TABLE 1.—FAMILY INCOMES OF THOSE FAMILIES WHO MOVED INTO THEIR HOMES FROM 1974 TO 1976 AND PRIOR TO 1974 WHO HAD VARIOUS TYPES OF MORTGAGES ON THEIR HOMES IN RURAL AREAS IN THE UNITED STATES¹

Family income	Type of mortgage			
	FmHA	FHA	VA	Conventional
Moved in 1974-76 (percent):				
To \$4,999-----	6.8	4.4	2.1	6.5
\$5,000 to \$9,999-----	40.1	15.2	5.6	16.4
\$10,000 to \$14,999-----	35.4	30.1	20.3	24.3
\$15,000 to \$19,999-----	8.6	20.4	30.2	20.6
\$20,000 to \$24,999-----	8.1	16.8	20.4	14.3
\$25,000 to \$29,999-----	1.0	8.5	12.2	7.6
\$30,000 to \$34,999-----	0	1.9	3.8	4.1
\$35,000 and over-----	0	2.7	5.4	6.2
Total-----	100.0	100.0	100.0	100.0
Median income-----	\$10, 433	\$15, 083	\$18, 652	\$15, 679
Moved in prior to 1974 (percent):				
To \$4,999-----	8.2	8.5	5.5	5.6
\$5,000 to \$9,999-----	30.0	18.9	7.0	14.3
\$10,000 to \$14,999-----	31.1	23.5	25.6	23.1
\$15,000 to \$19,999-----	18.3	20.8	24.2	22.1
\$20,000 to \$24,999-----	4.3	14.1	15.2	14.3
\$25,000 to \$29,999-----	4.1	6.7	12.2	7.9
\$30,000 to \$34,999-----	4.0	2.7	2.5	4.4
\$35,000 and over-----	0	4.8	7.8	8.3
Total-----	100.0	100.0	100.0	100.0
Median income-----	\$11, 901	\$14, 828	\$17, 465	\$16, 586

¹ Tapes of Annual Housing Survey, 1976.

TABLE 2.—AGE OF HEAD OF HOUSEHOLDS WHO MOVED INTO THEIR HOMES FROM 1974 TO 1976 AND PRIOR TO 1974 WHO HAD VARIOUS TYPES OF MORTGAGES ON THEIR HOMES IN RURAL AREAS IN THE UNITED STATES ¹

Age of head	Type of mortgage			
	FmHA	FHA	VA	Conventional
Moved in 1974-76 (percent):				
Less than 24.....	24.5	12.3	1.7	13.9
25 to 34.....	44.4	50.4	55.3	39.4
35 to 44.....	20.3	24.6	27.9	24.5
45 to 54.....	5.5	6.3	11.9	13.3
55 to 64.....	2.9	5.6	3.2	6.2
65 and over.....	2.4	.8		2.7
Total.....	100.0	100.0	100.0	100.0
Median age.....	29.7	31.5	32.7	31.1
Moved in prior to 1974 (percent):				
Less than 24.....	2.1	0.8		2.2
25 to 34.....	38.9	26.2	26.3	25.6
35 to 44.....	29.9	35.7	34.2	31.7
45 to 54.....	14.2	23.0	29.0	23.6
55 to 64.....	8.0	9.7	9.1	12.0
65 and over.....	6.9	4.6	1.4	4.9
Total.....	100.0	100.0	100.0	100.0
Median age.....	37.0	40.4	40.9	41.0

¹ Tapes of Annual Housing Survey, 1976.TABLE 3.—ETHNIC ORIGIN OF HEAD OF HOUSEHOLDS BY THE TYPE OF MORTGAGES ON THEIR HOMES FOR HOUSEHOLDS WHO MOVED IN 1974-76 AND PRIOR TO 1974 IN RURAL AREAS OF UNITED STATES ¹

[In percent]				
Ethnic origin	Type of mortgage			
	FmHA	FHA	VA	Conventional
1974-76:				
Black.....	11.2	7.9	3.9	2.6
Spanish American.....	4.6	1.1	2.1	1.2
Other ²	84.2	91.0	94.0	96.2
Total.....	100.0	100.0	100.0	100.0
Prior to 1974:				
Black.....	17.7	13.2	4.6	4.1
Spanish American.....	3.8	3.5	1.8	.4
Other ²	78.5	83.3	93.6	95.5
Total.....	100.0	100.0	100.0	100.0

¹ Tapes of Annual Housing Survey, 1976.² Includes other whites and other ethnic groups.TABLE 4.—TYPE OF SEWAGE DISPOSAL FOR HOUSING BY THE TYPE OF MORTGAGE ON THE HOMES FOR HOUSEHOLDS WHO MOVED IN FROM 1974 TO 1976 AND PRIOR TO 1974 IN THE RURAL UNITED STATES ¹

[In percent]				
Year moved in and type of sewage disposal	Type of mortgage			
	FmHA	FHA	VA	Conventional
1974-76:				
Public sewer connection.....	43.7	48.6	53.3	26.4
Septic tank or cesspool.....	56.3	51.4	46.7	72.5
Other.....	0	0	0	1.1
Total.....	100.0	100.0	100.0	100.0
Prior to 1974:				
Public sewer connection.....	26.3	40.4	45.1	22.8
Septic tank or cesspool.....	73.7	59.4	54.9	76.2
Other.....	0	.2	0	1.0
Total.....	100.0	100.0	100.0	100.0

¹ Tapes of Annual Housing Survey, 1976.

TABLE 5.—SOURCE OF WATER FOR THE HOME BY TYPE OF MORTGAGE FOR THOSE HOUSEHOLDS WHO MOVED INTO THEIR HOMES FROM 1974 TO 1976 AND PRIOR TO 1974 IN THE RURAL UNITED STATES¹

[In percent]

Year moved in and water source	Type of mortgage			
	FmHA	FHA	VA	Conventional
1974-76:				
Public or private system.....	68.9	77.9	81.2	53.5
Individual well.....	30.6	20.7	18.3	41.8
Other.....	.5	1.4	.5	4.7
Total.....	100.0	100.0	100.0	100.0
Prior to 1974:				
Public or private system.....	57.6	69.0	72.2	48.2
Individual well.....	39.5	29.8	27.5	48.3
Other.....	2.9	1.2	.3	3.5
Total.....	100.0	100.0	100.0	100.0

¹ Tapes of Annual Housing Survey, 1976.TABLE 6.—TYPE OF HEATING FUEL USED IN HOUSES BY THE TYPE OF MORTGAGE ON THAT HOUSE FOR HOUSEHOLDS WHO MOVED INTO THEIR HOMES 1974-76 AND PRIOR TO 1974 IN RURAL AREAS OF THE UNITED STATES¹

[In percent]

Year moved in and type of heat	Type of mortgage			
	FmHA	FHA	VA	Conventional
1974-76:				
Natural gas.....	26.4	39.0	46.0	29.7
Bottled gas.....	6.3	6.6	6.5	14.3
Fuel oil kerosene.....	11.4	13.4	10.8	22.4
Electricity.....	52.8	40.3	36.7	31.6
Other.....	3.1	.7	0	2.0
Total.....	100.0	100.0	100.0	100.0
Prior to 1974:				
Natural gas.....	30.4	40.4	47.0	35.2
Bottled gas.....	17.2	11.8	5.7	12.5
Fuel oil kerosene.....	22.4	23.4	21.7	30.9
Electricity.....	27.1	23.2	23.6	19.4
Other.....	2.9	1.2	2.0	2.0
Total.....	100.0	100.0	100.0	100.0

¹ Tapes of Annual Housing Survey, 1976.TABLE 7.—DISTANCE HOME TO WORK (1 WAY) FOR HEAD OF HOUSEHOLD BY THE TYPE OF MORTGAGE ON THEIR HOMES FOR HOUSEHOLDS WHO MOVED INTO THEIR HOMES FROM 1974 TO 1976 AND PRIOR TO 1974 IN THE RURAL UNITED STATES¹

Year moved in and distance to work	Type of mortgage			
	FmHA	FHA	VA	Conventional
1974-76 (percent):				
Works at home.....	0	0	0.5	0.5
1 to 9 mi.....	45.8	39.7	38.9	47.1
10 to 29 mi.....	41.0	46.3	50.5	39.6
Over 30 mi.....	13.2	14.0	10.1	12.8
Total.....	100.0	100.0	100.0	100.0
Median (miles).....	11.0	13.5	13.2	10.2
Prior to 1974 (percent):				
Works at home.....	1.0	0.5	0.4	0.9
1 to 9 mi.....	38.0	46.6	42.5	46.5
10 to 29 mi.....	47.8	40.7	40.8	40.4
Over 30 mi.....	13.2	12.2	16.3	12.2
Total.....	100.0	100.0	100.0	100.0
Median (miles).....	13.6	10.4	12.5	10.3

¹ Tapes of Annual Housing Survey, 1976.

TABLE 8.—RATING FmHA BORROWERS GIVE THEIR HOME BORROWERS WHO MOVED INTO THEIR HOMES 1974-76 AND PRIOR TO 1974 IN URBAN AND RURAL AREAS OF THE UNITED STATES¹

[In percent]

Year moved in and house rating	Urban	Rural	Total
1974-76:			
Excellent	14.7	41.8	33.5
Good	78.3	50.7	59.2
Fair	7.0	7.0	7.0
Poor	0	.5	.3
Total	100.0	100.0	100.0
Proportion of loans	30.7	69.3	100.0
Prior to 1974:			
Excellent	37.1	34.8	35.5
Good	48.7	53.5	52.1
Fair	12.4	11.3	11.6
Poor	1.8	.4	.8
Total	100.0	100.0	100.0
Proportion of loans	30.4	100.0	100.0

¹ Tapes of Annual Housing Survey, 1976.TABLE 9.—REASON HOUSEHOLDS MOVED IN THE PAST 12 MO INTO A HOME WITH FmHA MORTGAGE IN URBAN AND RURAL AREAS OF THE UNITED STATES, 1976¹

[In percent]

	Urban	Rural	Total
Job transfer		2.4	1.6
New Job		4.5	2.9
Commuting reasons		1.2	.8
Needed larger house	14.5	10.7	12.0
Newly married	4.9	3.6	4.1
Wanted own household	4.8	2.5	3.3
Want own residence	63.3	62.8	62.9
Wanted better house		2.3	1.5
Urban renewal, etc	4.7		1.7
Displaced Private Act	7.8	3.6	5.1
More conveniences		1.4	.9
Change climate		1.2	.8
Other		2.5	1.6
Total	100.0	100.0	100.0
Proportion of loans	35.2	64.8	100.0

¹ Tapes of Annual Housing Survey, 1976.

THE BENCHMARK HOUSE

(By Gertrude S. Fish, Ph.D.,* College of Human Ecology, University of Maryland)

INTRODUCTION

The group known as S-95 is more officially named the southern regional research project on Quality Housing Environment for Rural Low-Income Families. The Agricultural Experiment Stations at 10 land-grant universities fund the research. Dr. Betsy Davis is the representative from the Science and Education Administration (SEA) and Dr. Donald Steward is the representative from the Economic Development Division, both of USDA. Dr. Neal Boyd of Virginia Polytechnic Institute is the administrator of the project; I am the chairperson of the technical committee; Dr. Tariq Durrani of VPI is the vice chairperson, and Dr. William Boles of Auburn University is the secretary. Other active members are Drs. Kay Stewart from Oklahoma State; Alice Stubbs from Texas A. & M.; James Montgomery from the University of Georgia; Savannah Day and Faye Plowman from Florida State; Homer Hurst and Betty Campbell from VPI; Baird Gentili from the University of North Carolina at Greensboro; Harold Allen from Clemson University in South Carolina; Jaquelyn McCray from the University of Arkansas at Pine Bluff, and Cora McKown from Texas Tech.

There are three other agencies which have participated in the work of S-95. The Rural Housing Research Unit at Clemson University in South Carolina supports the participation of Jerry Newman, Luther Godbey, and Harold Zornig; the Tennessee Valley Authority supports the participation of Al Henderson, John Culp, and Alice Underwood; and the Appalachian Regional Commission supports the participation of Charles Hayes. Some new members are joining the new project which begins in 1979

THE BENCHMARK HOUSE

One of the objectives of the southern regional research project (S-95) was to "determine the acceptability and economic feasibility of innovative designs in rural housing."¹ One way to determine the acceptability and economic feasibility of innovations in housing is to pick one house as a basis for comparison and compare innovative houses to it. The house picked as such a Benchmark was the Farmers Home Administration plan H5-41a, a house that has been built all

*The results in this paper are based on analysis of data obtained from a survey conducted as part of the Southern Regional Research Project S-95, *Quality Housing Environments for Low-Income, Rural Families* funded by USDA Agricultural Experiment Station regional research funds under the Hatch Act. The content of this report is the sole responsibility of the author, who is the principal investigator from Maryland.

¹*Quality Housing Environment for Rural Low-Income Families*, Southern Regional Project Proposal, March 1973.

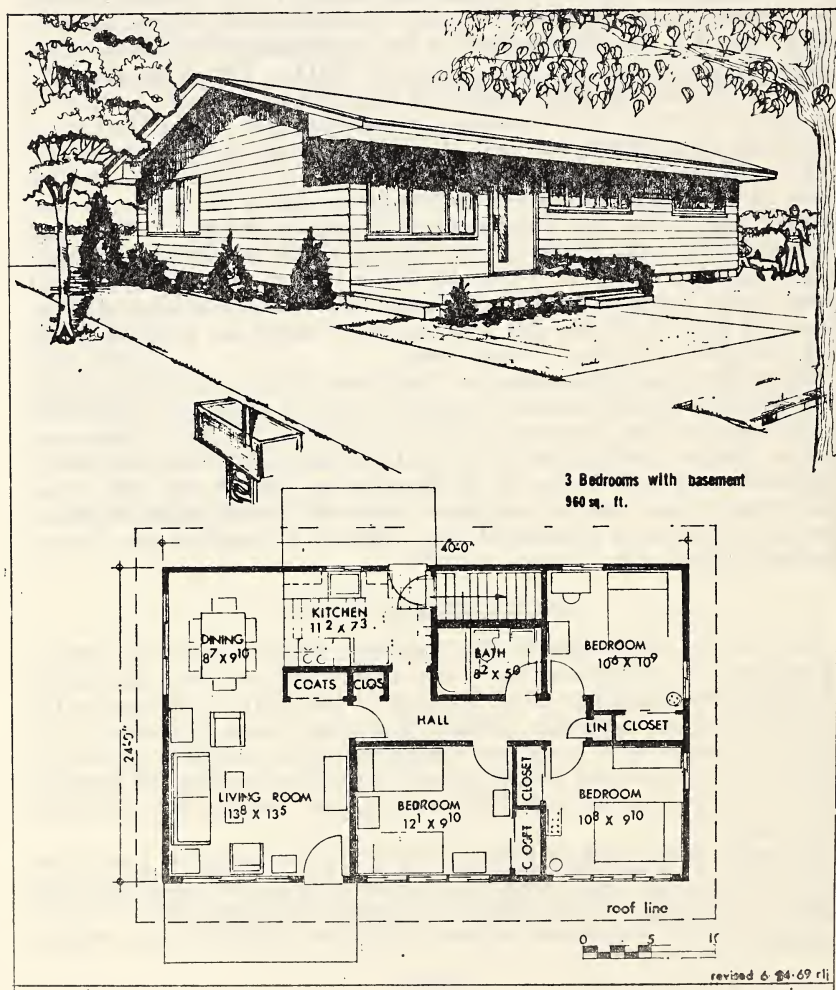
over the country in nonmetropolitan areas, and one which is modest in size and cost (see fig. 1).

The diagram of house plan H5-41a shows that it is a ranch-style three-bedroom house with about 960 square feet of floor space. If there is a basement, some of that space must be used for a stairway down to it, but some of the houses surveyed in Maryland did not have basements. Residents of 173 such houses not more than 7 years old were interviewed. Because income data was missing for 22 households those cases are eliminated in this discussion, and the paper is based on 151 cases.

HOUSE PLAN NO. H5-41A

U.S. DEPARTMENT OF AGRICULTURE—FARMERS HOME ADMINISTRATION

FIGURE 1.—The “yardstick” house selected by the S-95 prototype evaluation committee



PURPOSE

If the Benchmark house is to be used as a basis of comparison for rural housing it is important to describe it in relation to other rural housing. The purpose of this paper is to compare the housing experienced by residents of the Benchmark house with that experienced by a national sample of rural low-income families. The measures upon which the comparison will be made include physical conditions of deterioration, a measure of crowding, and a measure of housing deprivation that relates housing cost to household income.² The attitudinal responses of the residents of the Benchmark houses will also be considered. All of these measures will result in a partial description of the Benchmark house in relation to all rural low-income housing in the United States and will also suggest modifications of the Benchmark house to alleviate the conditions noted during the investigation.

DEFICIENCY INDICATORS FROM THE URBAN INSTITUTE STUDY

In September 1977 two researchers, Jeanne Goedert and John Goodman at the Urban Institute in Washington, D.C., published the results of a study that produced a list of deficiencies found normally in low-income rural nonfarm housing. They chose factors which varied by income level, saying:

If there is an inverse relationship between the occurrence of a housing deficiency (e.g., lacking complete plumbing) and household income, that characteristic is selected as a housing quality indicator. The quality indicators are thus based on the actual housing consumption of U.S. households, and not on a pre-established standard of decent, safe, and sanitary housing.³

The indicators were chosen to measure conditions of deterioration "that tend to be present in the dwellings of households with low long-run expected income."⁴ Their indicators, then, measure actual housing conditions experienced by rural low-income households.

The national sample used by Goedert and Goodman had been divided on the basis of income using the poverty income levels derived from the cost of a nutritionally adequate food plan in 1973. The poverty level incomes depend on the sex of the head of household and number of persons in the household. For instance, table 1 shows that the poverty threshold for households headed by men with four persons in the family was \$4,542 in 1973. By 1975, when the data on the Benchmark house was gathered, that amount had been raised to \$5,502, but for the comparisons that are to be made here, all incomes have been translated into terms of poverty levels. The average number of persons in the Benchmark houses was 4.2.

The incomes of the households in the first column of table 2 were at the poverty level or below it; the second column of figures represents data from households with incomes between the poverty level and twice that amount; the third column gives data for households with incomes between twice the poverty level income and four times the poverty level income; and the next column gives data for households with incomes over four times the poverty level.

² Gertrude S. Fish, "Variables Correlating with Housing Quality: A Search for a Statistical Measurement of Substandard Housing," paper for the course, Housing Market Analysis, Cornell University, December 1971.

³ Jeanne E. Goedert and John L. Goodman, Jr., *Indicators of the Quality of U.S. Housing*, Working Paper 249-2, the Urban Institute, Washington, D.C., 1977, p. ix.

⁴ *Ibid.*, p. xi.

TABLE 1.—POVERTY INCOME LEVELS, NONFARM RESIDENCE

Number of persons in household	Sex of head of household			
	Male		Female	
	1973	1975	1973	1975
1-----	\$2, 390	\$2, 851	\$2, 215	\$2, 635
2-----	2, 999	3, 515	2, 908	3, 460
3-----	3, 565	4, 317	3, 447	4, 175
4-----	4, 542	5, 502	4, 521	5, 473
5-----	5, 364	6, 504	5, 299	6, 434
6-----	6, 034	7, 322	5, 965	7, 270
7-----	7, 455	9, 056	7, 288	8, 818

Source: Bureau of the Census, 1974 and 1976 Current Population Surveys.

The average income of all the Maryland households was \$10,902. There were only three Maryland households with incomes at or below the poverty line so no division seemed useful. There were 92 households with incomes between the poverty level and twice that amount and the three below the poverty level are included in this category; 57 households had incomes between two and four times the poverty level; 2 had incomes above four times the poverty level.

Data was available from the S-95 questionnaire for 10 of the 23 indicators developed by Goedert and Goodman. Because the Farmers Home Administration (FmHA) requires housing which it finances to meet FHA minimum property standards, we can assume that the Benchmark houses all have complete and private plumbing and kitchen facilities, so we can compare the Maryland Benchmark houses to all rural nonfarm low-income housing in the United States on those two additional indicators.

The average income of the Maryland households in the first column was \$8,451.39; at incomes between two and four times the poverty level the average was \$12,996.63; and the two households with incomes above four times the poverty level averaged \$18,978. The incidence of the deficiencies decreases as income increases for all rural nonfarm households in the United States and for the Benchmark houses.

The incidence of deficiencies in the housing experienced by residents of the Benchmark houses is generally lower than that of the national sample of households at the same income levels except for cracks or holes in the walls or ceiling, holes in the floor covering, and the lack of air-conditioning. Because Farmers Home Administration policy stipulates that their mortgage loans be used for modest houses, some States discourage the installation of air-conditioning. The condition of floor coverings does not necessarily indicate the condition of the floors. However, walls and ceilings need improvement, especially since the houses were less than 7 years old.

JOINT CENTER FOR URBAN STUDIES INDICATORS

A study of housing quality from the Joint Center for Urban Studies in Cambridge used three indicators of housing deprivation, as follows: More than 1.01 persons per room, incomplete plumbing, and a cost of

TABLE 2.—INCIDENCE OF HOUSING DEFICIENCY OR HOUSING DEPRIVATION AMONG LOW-INCOME RURAL NONFARM HOUSEHOLDS IN THE UNITED STATES AND IN LOW-INCOME RURAL NONFARM HOUSEHOLDS IN BENCHMARK HOUSES IN MARYLAND, BY INCOME¹

Indicator	United States				Maryland		
	Y<P n=1,400	P<Y<2P	2P<Y<4P	Y>4P	P<Y<2P n=92	2P<Y<4P n=57	Y>4P n=2
Average income.....					\$8,451.39	\$12,996.63	\$18,978
Must pass through bedroom to enter other room.....	25.2	15.4	8.8	5.2	0	0	0
Water source other than public or private system or individual well.....	11.6	6.7	4.3	3.2	4.3	1.8	0
"Other" means of sewage disposal.....	22.3	7.5	2.6	.7	0	0	0
Lack air-conditioning.....	77.6	65.5	54.8	45.6	78.7	73.2	100.0
Leaky roof.....	20.8	10.9	7.0	5.2	4.4	1.8	0
Cracks or holes in walls or ceiling (other than hairline).....	14.3	6.7	3.7	2.1	12.0	8.8	0
Holes in floor (covering).....	8.2	2.4	1.4	.7	12.0	1.8	0
Peeling paint on walls or ceiling.....	16.9	11.0	7.5	4.9	6.5	3.6	0
Rodent or insect damage.....	29.2	20.3	14.7	12.1	5.4	0	0
More than 1 person per room.....	17.9	11.6	3.7	.3	6.5	0	0
Lacking complete and private plumbing facilities.....	28.6	10.0	3.4	.9	0	0	0
Lacking complete and private kitchen facilities.....	17.3	4.5	1.4	.6	0	0	0
Paying more than 25 percent of income for housing.....					78.3	26.3	0

¹ Sources: "Indicators of Quality of U.S. Housing," by Jeanne E. Goedert and John L. Goodman, Jr., working paper 249-2, the Urban Institute, Washington, D.C., 1977, p. 53, and data from the southern regional research project S-95 "Quality Housing Environment for Low Income Rural Families."

more than 25 percent of income.⁵ Table 2 shows that 6.5 percent of the Benchmark houses are crowded. The houses have six rooms, so some of the families must have had seven or more persons in the household. That would mean that either three persons slept in one of the bedrooms or that one person slept in a room other than a bedroom; and, given the minimum size of the bedrooms and the living space, one could conclude that overcrowding was indeed taking place.

All Benchmark houses had complete plumbing and kitchen facilities.

The amount spent on housing includes the mortgage payment, insurance, taxes, and utilities. The Farmers Home Administration 502 program has an income cut-off and gives the lower income families an interest subsidy, so the mortgage payment is controlled to some extent. Still, table 2 shows that 78.3 percent of the households with incomes below twice the poverty level are paying more than 25 percent of their income for housing. At incomes between twice and four times the poverty level 26.3 percent of the households are paying over 25 percent of their incomes for housing. According to the Joint Center study, households which pay more than 25 percent of income for housing are depriving themselves of other necessities such as food or clothing in order to pay for their housing.

It is interesting to note that only at incomes at least twice the poverty level does the incidence of deficiencies approach zero. According to the 1975 poverty levels a family of four would have had an income of about \$11,000. The residents of the Benchmark house in the twice-to-four times poverty level income column averaged \$12,996, and 26 percent of them were spending more than 25 percent of their

⁵ Joint Center for Urban Studies, *America's Housing Needs: 1970 to 1980*. Cambridge, Mass.; M.I.T. and Harvard University, December 1973.

incomes on housing. In other words, at an income of twice that allowed by the much used poverty-level income the family still experienced deficiencies in housing common to low-income households and some of the families were depriving themselves of other necessities in order to pay for their housing costs.

CRITICISMS OF RESIDENTS

One further test of the Benchmark house is the data collected from the residents. Table 3 shows the average ratings on a scale from one to nine for several factors and indicates general satisfaction with the housing. However, the amount of storage space outside and inside the Benchmark house was criticized by the residents as was the overall size of the house. When asked what changes they would make to improve their housing, one-third of the families expressed a desire for additional space. The greatest dissatisfaction was expressed on an item measuring their feelings about the cost of utilities. The majority of the houses had electric heating, and the utility bills had increased alarmingly. The average monthly utility bill was \$77 and was a source of concern to the families. Table 4 shows the range of the monthly utility costs with 23 percent of the households owing over \$100 a month for utilities.

TABLE 3.—*Housing adequacy ratings*

Characteristic rated:	Households (n=151) mean rating *
Location of your home in relation to where your children go to school..	8. 1
Fire protection that is available.....	7. 7
Quality of the schools.....	7. 5
Location of your home in relation to where you go most often for church and social activities.....	7. 5
Location of your home in relation to where the main wage earner works.....	7. 0
Location of your home in relation to where you shop.....	6. 9
Police protection that is available.....	6. 6
Location of your home in relation to medical services.....	6. 6
Conditions of the streets/roads that lead to your home (excludes driveway).....	5. 7
The amount of storage that you have outside (not storage for farm equipment).....	4. 9
The amount that you pay for utilities (water, lighting, heat, etc.)----	3. 5

* Ratings are based on a 1 to 9 scale; 9 is the most satisfactory, 1 is the least satisfactory.

TABLE 4.—*Monthly utility costs*

Monthly utility payment:	Households (n=151) percent
\$32 to 40.....	3. 3
41 to 50.....	4. 0
51 to 60.....	11. 3
61 to 70.....	13. 2
71 to 80.....	19. 2
81 to 90.....	15. 2
91 to 100.....	10. 6
101 to 110.....	7. 9
111 to 120.....	5. 3
121 to 205.....	9. 9

FINDINGS

The responses of the residents would suggest modifications in the Benchmark house to increase outside and inside storage, the overall

size of the home, and changes to decrease the utility bills. The comparison of the Benchmark house to all low-income rural nonfarm housing in the United States suggested that either the materials or the construction methods for the walls and ceilings should be improved; analysis of the cost of housing as a percentage of income suggests that the cost of utilities should be lowered.

The conditions of deterioration, deprivation, and crowding found normally in the housing of rural low-income families were also found in the Benchmark houses when income was below twice the poverty level. Since the Benchmark houses were 7 or less years old one could conclude that either the construction methods and materials need improvement or that at incomes lower than twice the poverty level families do not spend money on maintenance. Further analysis of the data may yield more information on this question.

APPLICATIONS

The percentage of income spent on housing is directly related to the cost of utilities, so lowering the cost of heat and hot water would be one way to modify the Benchmark house to lessen housing deprivation. The researchers in S-95 have helped builders in the Appalachian region obtain grants for solar attic heating systems on 15 Benchmark houses. These houses are under construction now and all costs are being recorded. The operating costs will be collected during the next 3 years while families live in them to see whether utility bills and the percentage of income spent on housing are reduced.

Outside storage space in these houses has been increased by the addition of a garage, and the overall size of the houses has been increased to 1,124 square feet. Research in the next 5 years will assess the problems with the walls and ceilings and modify them.

By determining the satisfaction of the residents of the solar attic houses and comparing their criticisms with those of the residents of the Benchmark houses we will be able to "determine the acceptability of innovations in housing." By comparing utility costs we will determine the economic feasibility of the innovation in the heating system. By comparing the percentage of income spent on housing for both groups we will make one other measure of the economic feasibility of the solar attic houses. By using the indicators developed by Goedert and Goodman we will be able to compare the incidence of deficiencies in the housing produced by the Farmers Home Administration section 502 program in Maryland with that of the innovative solar attic houses. The comparisons should be of interest to all mortgage lenders faced with requests for mortgages on houses with similar solar attic heating systems.

The Benchmark house is not meant to be a "minimum standard." It is intended to be used as a basis of comparison for other houses. In this paper we have compared it to housing of other rural families of matched income levels on 13 conditions of deterioration, deprivation, and crowding found in housing of rural low-income families nationwide. The dissatisfactions expressed by residents of the house have been taken into account in the design of a similar house with a solar heating system. The information derived from the S-95 project will help make better housing available to rural low-income families.

THE MISSOURI SMALL FARM FAMILY DEVELOPMENT PROGRAM

(By Charlotte George, State Family Resource Management Specialist, USDA)

During 1977, 40 percent of the families participating in the Missouri small farm family development program reported their income was above the previous year. The combined estimated total additional income amounted to \$850,000 for these families.

Over 1,800 families participated in the small farm family program in 1977. Most of the families had little prior contact with the Cooperative Extension Service in Missouri. During the year, 49 education assistants located in 33 counties were assisting 1,835 families in determining family goals, and providing them with suggestions and information for reaching their goals.

HISTORICAL STATEMENT

Under the second Morrill Act of 1890, Lincoln Institute, founded in 1866, in Jefferson City, Mo., became a land-grant college and, in 1891, added industrial and agricultural courses to its curriculum.

After gaining land grant status, Lincoln University has emphasized agriculture as a part of its curriculum. From 1891 to 1939, the program oscillated between a few course offerings, to a 2-year certificate program, to a short-lived 4-year program leading to the B.S. degree in agriculture. The object of the course of study at that time was to train farmers and teachers of agriculture for the black public schools of Missouri.

In January 1940, a major in agriculture leading to the bachelor of science degree was instituted and has continued uninterrupted to the present.

In 1967, the Department of Agriculture initiated an extension program in animal nutrition supported by a grant of \$18,239 from the U.S. Department of Agriculture. The Department received grants at this level annually until 1972 when major funding was obtained on a continuing basis through Public Law 89-106.

The Department of Agriculture initiated an extension program in December 1971, with the enactment of an amendment of the Smith-Lever Act and the subsequent Federal appropriation for the 1890 land-grant institutions.

In 1976, Lincoln University cooperative extension implemented the small farm family resource management program in 11 program planning areas of Missouri.

MISSION STATEMENT

The Cooperative Extension Service at Lincoln University endeavors to assist Missouri citizens in the resolution of social, economic, tech-

nical and related problems, and the improvement of the quality of life. The focus of this service is on citizens of Missouri not participating in Cooperative Extension Service programs, or more specifically, low-income and/or minority families. The Cooperative Extension Service is a part of a statewide extension system in which mutual cooperation is fostered between Lincoln University, and the University of Missouri.

PROGRAM OBJECTIVE

The objective of the small farm family development program is to assist families living on small farms, not currently participating in extension programs, to use available resources to improve their quality of living.

This objective is to be reached by paraprofessionals helping families improve their economic and social well-being by increasing their knowledge and skills in agriculture technology, the management of family resources, and home gardening.

In August 1976, Federal legislation provided funds for the small farm family resource management program at Lincoln University to begin an effort to help families living on small farms to better manage their resources in order to reach family goals, realize some cost savings and/or increase their income; thereby having a better quality of life and gaining satisfaction for its members.

PROGRAM THRUSTS

The majority of Missouri farm families live on small farms. Families living on small farms gross less than \$20,000 a year in farm sales. The 1974 Census of Agriculture reported 115,711 farms in Missouri. Seventy-five percent of these families grossed less than \$20,000 in the sale of farm products. Records kept by farm families show that 70 to 80 percent of the farm sales were spent for farm production expenses. Assuming no other income, many of these families would have a net income of about \$4,000 per year.

In order to assure that the family resource management program has linkage and utility from Lincoln University, data were gathered from 8,527 families to determine their farm and home management practices and aspirations. The survey results indicated the estimated gross income of these families to be \$7,657 annually, or approximately \$1,500 net income to be used for family living expenses. The average age of the homemakers interviewed was 48 years and the average age of the operator was 51 years. Thirty-four percent said the biggest problem they faced was financial. Health was cited by another 23 percent as their biggest problem. When shopping for food, 26 percent said they never shopped from a list and another 19 percent of the homemakers stated they sometimes shopped from a list. Twenty-three percent said they usually paid their farm and home bills by cash or money order rather than by check. The summary of the responses indicated that in 74 percent of the households interviewed, both the husband and wife were involved in making major household decisions.

The data gathered revealed facts about children and the interpersonal relationships within the household. Nine percent of the respondents cited raising children as the biggest problem their family faced. Twenty-six percent of the homemakers stated they received

help from children with household chores; however, only 3 percent of the husbands and wives indicated they involved children in making decisions as it related to the family.

Nearly one-half of the households stated that they did not see future opportunities for their children in the immediate area and 47 percent of the respondents did not recommend farming as a career for their children.

Many of the families expressed a desire to make changes in their house. Among the changes listed were: 600 families would like a new roof; 1,168 households would like to add insulation and/or install some type of storm doors and windows and 1,712 families would like to paint the inside and/or outside of their homes.

One of the important vocational characteristics was that 46 percent of the surveyed families had lived on the farm less than 10 years.

The program centers around 11 area home economics designees teaching practical subject matter information and educational methods to 49 education assistants.

The areas of learning emphasized during 1977 were:

1. Management and decisionmaking skills needed for successful integration of farm and home production skills such as home food production and preservation.

2. Management of realistic recordkeeping skills for families living on small farms to analyze successful and efficient use of human and other available resources.

3. Practical home weatherization skills needed by families to conserve energy, realize a cost savings in fuel bills and improve their near environment.

Because higher prices reduced the purchasing power of families living on small farms, the 11 area home economics designees taught the education assistants and program families how to apply basic skills in order for a cost savings and/or increase in the family's income to be realized.

CHARACTERISTICS OF PROGRAM FAMILIES

About one-half of the participating heads of households were less than 45 years old. Thirty-nine percent of the heads of households were between 46 and 64 years old. The remaining 11 percent were over 65 years of age. The proportion of homemakers in the three age categories was almost identical with less than 1 percent more in the two younger age categories.

Twenty-six percent of the participating heads of households had not completed high school, while 61.5 percent had a high school education and another 12.5 percent had some schooling beyond high school. Again, as in the age distribution, the homemakers were quite similar to the heads of households. Among the homemakers 26.4 percent had less than a high school education; 60.3 percent had completed high school and 13.3 percent had gone to school beyond high school graduation.

About 32.2 percent of the participating families had less than 5 years of farming experience. Another 34.3 percent had 5 to 10 years of experience and the rest, 33.4 percent, had farmed more than 10 years.

Probably the most interesting characteristic of the participant families is that 25.7 percent are full-time farmers. In 23.7 percent of the households both the head of household and spouse worked off the

farm. In another 36.7 percent of the participant families only the head of household worked off the farm, while the spouse only worked off the farm in the remaining 13.9 percent.

Families who have participated in the program 2 or more years is 11 percent. This figure is low due to the fact that the program in 7 of the 11 areas has been in operation less than 2 years. In the four areas where this program has been in operation since 1972, 27 percent of the families have participated 2 or more years.

For the 11 areas 42.7 percent of the families have been in the program less than a year and 45.3 percent have participated almost 2 years. In the four areas where the program has been in operation since 1972, 37 percent have participated less than a year and another 36 percent 1 to 2 years.

FAMILY INCOME CHANGES

The estimated income changes of families participating in the small farm family program reflects both the farm business and off-farm sources of income.

The following data represents estimates of the change in family income in 1977 compared to the year before:

1. Forty percent of all participating families or 717 families had an increase in total gross income averaging \$1,047 per family in 1977. This amounts to \$750,699 more total gross income for these 717 participating families.

2. Thirty-seven percent or 670 families had an average of \$454 more total net income for 1977. This amounts to \$304,180 more net income for these families.

3. One hundred fifty-one or about 9 percent of families had a decrease in total net income averaging \$515 per family.

4. Four hundred forty-three or about one-fourth of all families net worth increased by \$914 per family. Changes in net worth are in addition to income charges reported.

5. Five hundred twenty-two or 28 percent of the families had a total savings averaging \$270 per family over the previous year on family living expense items such as food, clothing, heating, shelter, and transportation.

The income changes these families achieved in 1977 indicates that families living on small farms who have relatively low farm sales and off-farm income can obtain more income by better management.

Forty percent of the families in 1977 increased their net income, net worth and savings by \$850,000. It is expected that more of these families will have increased income next year from additional enterprises.

INDICATORS OF PROGRAM EFFECTIVENESS BASED ON EXTENSION PUBLICATIONS 202-205

The home food production and preservation component is an integral part of the program. The program emphasized assisting families in acquiring skills to provide their own food and reducing food costs through increased preservation and/or the sale of vegetables.

In reviewing the gardening activities of program families, there was a cost savings realized. There were 113 families gardening for the

first time. The total number of quarts of food produced and preserved by program families was 131,113 quarts or \$52,445 worth of food.

In one of the program units, 56 families produced a total of 22,400 pounds of meat for consumption or \$11,200 worth of food. This did not include the number of families who bagged venison, rabbits, squirrels, other wild meat, or fish.

The success of any business depends on how well its activities and details are planned, organized, and carried out. The business of running a home is just that—a business. When the home is a farm home, the recordkeeping assumes a dual role in carrying out activities for the business of living and for the business of farming. During 1977, 192 families began keeping a written record of farm and family living expenses.

Working with 1,245 families, education assistants encouraged families to inventory their resources and establish future goals in line with their available resources.

In one program unit, 100 percent of the education assistants established a farm and home business center and filing system, including a written record of family living expenses. Ninety-eight percent of the program families discussed future family goals with their education assistant.

In an effort to increase their purchasing power, 489 families applied home weatherization practices which resulted in a cost savings that ranged from \$18 per family to \$310 per family during 1977.

Five families in one area installed wood-burning heating stoves and used wood from their farm at a savings of approximately \$370 per family per year. Records from another area indicate that 40 families who installed wood-burning stoves realized a savings of \$75 per month per family.

In an effort to help families adopt practices to reduce family clothing costs, a sewing clinic was conducted jointly by the textiles and clothing and family economics and management specialists.

Ten families learned the procedures for filing a consumer complaint. As a result of filing the complaint with a sewing machine company, the families realized a cost savings of \$40 each by having the machines made operable by the company at no charge.

Eight hundred and eighty-nine families participating in the program acquired and applied skills for repairing door and window screens, replacing electrical receptacles and/or plugs and repairing leaky faucets. The total cost savings realized by these families was estimated to be \$8,890. Two hundred and fifty-four of the families are FmHA cooperators, and over two-thirds of the families have been participating in the small farm family program less than 2 years.

Though there are tangible, immediate indicators of program effectiveness, there is a sizable group of families living on small farms throughout our country who are outside of the mainstream of society. By increasing their farm and family decisionmaking and management skills, they will have the opportunity to become decision-makers rather than reactors to policies as it relates to the production and marketing of food, conservation, and maintenance of our natural resources, the allocation of our human and economic resources and consequently, be able to function more effectively in the marketplace.

PERSPECTIVE IN NUTRITION

(By D. Mark Hegsted, Administrator, Human Nutrition Center, USDA)

I had the pleasure of addressing this group a year ago. The issue discussed in that session was the "Dietary Goals for the United States" published by the Senate Select Committee on Nutrition and Human Welfare (1). These indicate moderation of the American diet to reduce, not only the total energy intake of many, but of saturated fat, cholesterol, sugar, and salt as desirable objectives which should be incorporated into general dietary advice. I concluded then that we were about past the stage of argument and that we should get on with the business of incorporating this message into the general nutritional message. I have seen no developments in the past year which would lead me to change that conclusion.

This is not to say, of course, that everyone has reached the same conclusion. Apart from the opposition of certain segments of the food industry which is probably to be expected, there have been a few vocal scientific opponents (2, 3). The opponents, however, have not offered anything very helpful but rather conclude either that Americans really have no health problems related to nutrition or have been simply negative—"We don't know enough to advise the American public about their eating habits."

This is a strange position for nutritionists to take. I have listed in table 1 the recommended nutrient intakes for adult men taken from several sources. Apart from the RDA committee of 1945 when knowledge was certainly less than that now available, we have to appreciate that the basic information available to these various groups was similar if not identical. Nor is there any particular reason to believe that the degree of expertise was necessarily greater or less in one committee or another. We have always agreed—correctly, I think—that dietary standards should be modified periodically to allow for the use of new knowledge. I have also argued that dietary standards should not necessarily be the same for various populations. Priorities may vary depending upon the experience in different countries.

Yet those of you who are familiar with the development of dietary standards will appreciate that the standards developed are greatly influenced by the philosophy of the group which sets the standards. For example, when the Canadian standards were developed in 1950 (4) they attempted to establish a minimal level—one below which health could not be assured. The RDA's, on the other hand, were originally established as "goals we should strive to meet." Thus, one group established a level which would presumably identify deficiency—as they understood the data—but left open the possibility that higher levels might be advantageous; the other established a goal but did not attempt to define the consequences of a lower level of consumption.

For some nutrients, of which protein is the most conspicuous, the RDA's have gradually shifted toward the definition of a supposed minimal level which is now lower than most Americans consume. Other nutrients, like vitamin A particularly, have been left alone largely because the American diet has the capacity to provide plenty; there seemed to be little need to modify the level; and not much research has been done on actual requirements.

Now I do not believe these variable conclusions mean that we do not know anything about nutrient requirements. Many of the differences can be accounted for by differences in how the standards are supposed to be used. Yet, the variability in the recommendations quite clearly also does mean that we are simply uncertain of the best intake. If we had proof of the best intake, the recommendations made by various expert groups would be the same.

The major points I want to make are, first, that dietary standards or guidelines are expected to vary over time. These changes reflect not only the basic information base but many other things. Secondly, and most importantly, we do not establish dietary guides only when we have proof of where they should be set. We establish guidelines because we need guidelines. We know that man requires a variety of essential nutrients. We have data from populations which consume different amounts; we have some data on experimental animals fed different amounts; for most nutrients, we have some data from clinical studies and metabolic trials. From such sources we can estimate intakes that are probably satisfactory. For a variety of reasons we need these kinds of estimates even though they may not be accurate reflections of true requirements.

Another point probably should be made. Most scientists are intrigued by quantitation. We are taught that mathematics is the highest and purest of all science and it has been argued that it really isn't science unless you can quantitate it. I don't decry this. In nutrition we should strive for more exact measures of actual nutrient requirements. But much of biology is not very quantitative and the utility of exact measures of many things varies a great deal. An average daily temperature change of a few degrees over a year or two or longer may have profound effects on climate. Yet most of us don't really care whether the temperature today is a couple of degrees above or below that we heard on the weather forecast. Similarly, most of us vary our intake of many nutrients by 50 to 100 percent from one day to the next. We don't have much ability to regulate our diet closely and there is no reason why we should. Neither do we have accurate techniques for measuring what any individual eats except under very unusual circumstances. Thus, although the nutritional community may argue endlessly about dietary standards and whether they should be pushed up a bit or down a bit, the consequences of these manipulations are rather small.

Raising or lowering a dietary standard doesn't directly influence what we eat. Changing standards does, however, modify the "nutritional message" and should have other effects, as in the development of standards for school lunch programs. The gradual fall in the RDA for protein over the years represents, in part, changing knowledge about protein requirements but it also represents a response to the excessive attention that protein has received. Most Americans con-

sume much more protein than anyone is thought to require. Why then do we have so much propaganda and emphasis upon the protein content of foods, attempts to increase the protein content of some foods or increase the protein quality of foods? It sometimes appears that "protein" and "good nutrition" are almost synonymous terms in the public's mind.

What should be clear to everyone is that although we still have much to learn about nutrient needs of man, and the more we know the better job we will be able to do in advising people how to eat, the provision of sufficient amounts of the essential nutrients is not so difficult to achieve in our society. Not only do we have an overly abundant food supply, we can utilize techniques like the fortification of foods with essential nutrients if this is required. We are also willing to spend rather large amounts of money to assure that most Americans have access to our food supply. None of these schemes are as efficient or as effective as we would like it to be, of course, and additional efforts are required to improve them. Nevertheless, you may recall that the rather severe food restrictions imposed upon the British population during World War II are generally agreed to have improved the health status of that population. There were no epidemics of deficiency disease so even 30-40 years ago we knew enough to prevent severe nutritional deficiencies. This is not to say the British were optimally fed at that time and, even if they were, it is not likely that many would wish to participate in that kind of dietary experience again. Nevertheless, the wartime food restrictions required a more even distribution of the available food—improving the diet of the poor at the expense of the more affluent—and lowered the consumption of fat and sugar and moved the diet in the direction suggested by the dietary goals. Unfortunately, at that time we did not know enough to evaluate the influence of that experience upon some of the things that would be of primary interest today.

Nobody would suggest, of course, that Americans should or would eat severely restricted diets. What I do suggest is that with our ingenuity and resources—resources in research capability and in the food industries—we certainly can develop acceptable food and diet patterns that incorporate at least some of the advantages of more moderate diets than those we now consume. Obviously it is more difficult to devise diets that limit the consumption of good foods than to encourage the consumption of good foods and still more difficult to get the public to consume these kinds of diets. This is only a measure of the job we have before us.

A major argument against general dietary advice has been that since not all individuals are equally susceptible to the effects of dietary fat, salt, cholesterol, et cetera, dietary advice should be reserved for those who are susceptible (5). This may sound reasonable but it is not. For example, no advice about total energy intake would be provided until the individual was obese, that is identified as susceptible. This recommendation is the antithesis of prevention which is surely the major objective in providing any kind of dietary advice. Certainly we do not believe that we should withhold any dietary advice about nutrient content until an individual can be shown to have rickets, pellagra, or other deficiency diseases.

We know that about 50 percent of American men die of coronary disease, about 20 percent of cancer, about 5 percent have diabetes and about 20 to 25 percent have hypertension. Consider the dilemma of a family of 10 members who demonstrate average susceptibility. Five or more are at some risk of heart attack, two at risk of cancer, one at risk of diabetes, and two or three at risk of hypertension but the specific individuals within the family who are most susceptible to one or the other risk cannot be identified. How then does the family feed itself? Clearly the only sensible thing the family can do is to attempt to feed itself so that risk of all of the diseases is minimized. Even if we could identify which family members were at high risk of each disease, the practical difficulties of devising a special diet for every member of the family are so large and onerous that it would not be done. Thus again, the sensible thing for the family to do is to consume a diet which moderates the risks in general—lower the fat, salt, sugar, cholesterol, and increase the consumption of fruits, vegetables, and grain products. This is particularly sensible since such a diet does not increase the risk for any member of the family.

This, of course, is the situation in the community at large. We are all at risk of developing the diseases Americans die of whether these be the chronic diseases mentioned, automobile accidents, exposure to pollution, carcinogenic agents, et cetera. We do not have the capacity to identify which individuals are more or less susceptible to any of these risks and even if we could it is unlikely that the information would be very useful. Would we allow carcinogenic agents to be in the food supply and attempt to tell only those who are susceptible to avoid them? The American population deserves whatever advice or information is available which will allow them to minimize risk of nutritional disease—either deficiency disease or the results of excessive consumption—or, stated the other way, to allow them to take full advantage of our generous food supply to promote optimum health.

Many people have very definite ideas of what can or cannot be done but where these ideas come from is not very clear. Some have stated that a diet containing less than 35 percent of calories as fat is not acceptable. Certainly the success of Italian and Chinese cookery can be cited in opposition to this. A great many Americans are now interested in modifying their diets and even some of the popular chefs are turning attention to methods of cooking which pay attention to nutritional problems. I see no reason to be pessimistic about what we may be able to achieve and no reason to be dogmatic about what the public will or will not accept.

It is becoming increasingly clear to many people that we need to know a lot more about why we eat what we eat. Undoubtedly, this involves at least two things—why, how, and when we learn our food habits and the sensory aspects of foods. It is not likely that we will be truly successful until we know more about this field.

Most nutrition education is based upon the supposition that if we know more about the nutrient needs of the body we will apply that knowledge to improve our health. We can point to successful achievements but it is clear that this is not as successful as it ought to be. Certainly one of the problems we face is that this approach tends to ignore the major reasons why we eat. We eat foods because we like

them. This involves flavor, texture, taste, smell, appearance and probably other things and our appreciation of these depends upon past experience.

When we really understand foods and nutrition in the way we should, we will have not only a Handbook 8 which tabulates the nutrient content of foods, we will have a comparable Handbook which tabulates the other characteristics of foods in some sensible way so that we can use the information to predict the acceptability or desirability of foods. In this whole area of foods and nutrition we haven't even discovered what would correspond to the essential nutrients. All we know is that foods are different and we can devise many mixtures that are more or less acceptable than others. It is time to make serious efforts to develop research in this area. Obviously, we pay much more to satisfy our food needs, as defined by acceptability, than we do to provide nutrients.

There is great interest now to develop some evaluation of various kinds of efforts in nutrition education. I think this must be done but whatever we do today will be simply empirical. We can study food consumption before and after education efforts and determine whether or not we change food consumption patterns. But to do this endlessly for every kind of effort and for every variant of every method, is not very challenging and will not be as productive as it should be. Again we need fundamental knowledge about how or why food preferences develop. If we knew that we would be in a much better position to devise methods to change food habits. We ought to begin to develop viable research programs to develop these areas as science.

As I have already indicated, practically all of the food industries that see modification of nutrition education as a threat to their markets have reacted in rather predictable fashion. I believe what everyone has to realize is that (1) too much of anything is bad, and (2) there really are no good and bad foods—everything depends upon how much we eat and what we eat with it. The food industries feel that it is perfectly legitimate to propagandize the nutrient aspects of their products—even when these are trivial—but that is unfair or worse to warn the consumer about the unfavorable aspects of their product. Yet, since overconsumption of anything is undesirable, the consumer needs a balanced presentation. In our society, the great majority of consumers have little or no difficulty in getting enough essential nutrients if they have moderately sensible dietary habits, but many do consume in excess. What the consumer needs is a balanced presentation. Neither the nutritional educations which we have had nor commercial advertising have provided that kind of information.

The opponents of the dietary goals also exaggerate the possible effects which may flow from that kind of a nutrition message. It is obviously true that all nutrition education is aimed at changing food consumption patterns. To the degree we are successful, we will modify the markets for products. But we also know that we will not be successful enough to produce any precipitous changes in the marketplace. Nutrition education is only one of the things—like cost, availability, et cetera—which will modify consumption patterns. And the valid message is simply one of moderation even though this tends to get lost in the arguments between those who find absolutely nothing to criticize about their product and those who exaggerate the undesirable

effects of various products or constituents. Moderation and common-sense will, however, eventually prevail.

Finally, it is quite clear that Congress and the public are calling for increased activities in nutrition—increased efforts in research, increased efforts in nutritional surveillance, and increased efforts in nutrition education. There are few things that should be placed in perspective. One is that increased efforts in research depend on money, facilities, and trained people. So far there has been insufficient attention to training of qualified researchers. Since it takes 10 to 15 years to train a researcher, this ought to be a priority area in the immediate future.

Secondly, with regard to surveillance, it should be recognized that the state of the art is not very advanced. We can only do what we are capable of doing. We must begin additional efforts in surveillance and monitoring and the evaluation of programs but in the long run these activities require a substantial research effort. Many people now have expectations that we cannot fulfill.

And, thirdly, if we increase and improve our efforts in nutrition education, we have to be clear as to what the nutrition message is. I do not believe we can continue to do what we have been doing in the past or using the same tools that we have used in the past. We must and will move immediately to develop that revised message. It must be aimed at assuring an adequate intake of essential nutrients—as it has in the past—but incorporate an appropriate guideline to moderate consumption of those foods and food components which should be limited.

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TABLE I.—RECOMMENDED INTAKES OF ADULT MEN

	Protein (gm)	CA (mg)	Iron (mg)	Ascorbic acid (mg)	Vitamin A (IU)
RDA 1945.	70	800	12	75	5,000
RDA 1968.	65	800	10	60	5,000
RDA 1972.	56	800	10	45	5,000
United Kingdom 1969.	73	500	10	30	3,750
WHO/FAO.	46	4-500	5	30	3,750

EXPANDED FOOD AND NUTRITION EDUCATION PROGRAM UPDATE

(By Nancy B. Leidenfrost, Deputy Assistant Deputy Director, EFNEP
SEA-Extension, USDA)

The expanded food and nutrition education program is the largest federally funded food and nutrition education program in the United States. It is administered by the Science and Education Administration, USDA, through the 1862 land-grant university cooperative extension services.

If you had asked the average American about the nutritional status of families in the United States in 1965, the response probably would have gone something like this: "This is the richest Nation in the world. We have the highest standard of living in the world. Except in very isolated instances, nobody goes hungry in our country." A booming postwar economy bringing a rapid increase in material wealth, had lulled the vast majority of American citizens into assuming that abject poverty and hunger had died with the Great Depression of the thirties. The reality was, however, much different. There was hunger in America, though it was hidden from most Americans.

The pervasive problem of hunger and malnutrition in the United States began to surface in the sixties. Facts and figures were rolling in, describing human misery in clinical terms of inadequate percentage of daily nutrient requirements. More compelling than numbers, however, were the eyewitness accounts of Members of the U.S. Congress.

Situations where families reported that they had only one meal a day, "but never had any milk or fruit or fresh meat." Where there was no food in the house and no money; where children were visibly underweight; and where families lived in tar paper shacks.

These accounts and hundreds like them from around the country left all who read them stunned. Stark illustrations of the appalling conditions in which millions of Americans were living appeared in the news media. It became apparent that hunger and malnutrition were not confined to any geographic region. The problem affected all ethnic groups, it appeared in the cities and rural areas. Estimates of the magnitude and pervasiveness of the problem differed, but two general conclusions were inescapable: Several million Americans were living at or below the poverty level; children and adults in low-income families were suffering from inadequate nutrition.

With the problem defined, numerous approaches to solutions were proposed. Some, such as the U.S. Department of Agriculture's food distribution and food stamp programs focused on the quantity of food available to low-income families. While this essentially provides families with available food or the resources to buy food, it was not the entire solution to the problem of poor diets. Education appears to be the prevailing answer. In this context, the expanded food and

nutrition education program (EFNEP) was born. EFNEP was designed to attack the particularly insidious problems of hunger in America. Insufficient education about the importance of nutrition and isolation were basic problems upon which EFNEP would focus its objective.

EFNEP is a food and nutrition education program tailored specifically to the needs of a low-income audience. The program objective is "to help low-income families, especially those with young children, to acquire the knowledge, skills, attitudes, and changed behavior necessary to improve their diets in normal nutrition."

The education program is delivered on a 1 to 1/small group basis by paraprofessional nutrition aides. The paraprofessional aides are trained and supervised by Extension home economists who administer the program at the operating sites.

EFNEP did not evolve overnight. Through the early and middle 1960's, the Extension Service (ES-USDA), funded a series of pilot studies. Results of these studies identified effective approaches for contacting, teaching, measuring behavior change, and maintaining an educational program with low-income families. Program concepts, educational materials, and organization and management principles tested in the study were used to launch the program.

In November 1968, EFNEP was initiated with \$10 million from section 32 funds. The following year Congress appropriated \$30 million and in 1971 \$50 million. The budget has remained constant since that time. Currently 20 percent of the funding is earmarked for youth and 80 percent for the adult program.

This week EFNEP celebrated its 10th birthday. It still operates with much of the enthusiasm it had in November 1968. The sum total of the State Cooperative Extension Service data is our best source of documented accomplishments. There are approximately 1,200 program sites in the 50 States and Puerto Rico. The national status is the accumulative result of State programs.

Family participation in the program

Let's look at the national status of the program. In June 1969, over 131,000 homemakers were enrolled. We see that enrollment expanded rapidly through 1971 when more than 361,000 families were in the program. Beginning in late 1971, the number of families added began to decline and the number of families leaving the program began to expand more rapidly. It should be noted that the number of paraprofessional aides peaked in 1971 and then declined. This contributed significantly to the decline in the number of new program families.

Through September 1977, an accumulative total of over 1,568,777 homemakers have participated in the program, representing approximately 6 million (5,998,289) family members.

Income

Seventy-three percent of the families have incomes under \$5,000 and 32 percent under \$3,000. The nonfood stamp families' income is about \$100 higher (NFS=\$390.33—FS=\$282.76) than the food stamp family at program entry. Approximately 34 percent of the family's income is spent on food.

Age of homemaker

Family participation is younger and better educated. About 22 percent of the families are under 24 years of age. The 25- to 55-year-old group has remained quite constant since 1972, averaging just more than 60 percent.

These data indicate that EFNEP is becoming increasingly effective in enrolling younger homemakers while simultaneously reducing the emphasis on older homemakers. Older homemakers are less likely to have large families or young children living at home.

Education

Food stamp homemakers participating in EFNEP have less formal education than nonfood stamp homemakers. About 45 percent of the food stamp homemakers have less than an eighth grade education. The corresponding figure for nonfood stamp homemakers is about 35 percent. From 1972-76, 50 percent of the homemaker participation was less than eighth grade.

Since 1976, homemaker participation has gradually become better educated. This change may be a result of working with younger homemakers who have completed more formal education.

Program families in urban areas

As of March 1978, about 58 percent of the program families resided in urban areas. This figure is about 8 percent lower than the average for the preceding 10 reporting periods. There has been a moderate downward trend in the percentage of EFNEP families in urban areas since December of 1972. The trend has averaged about nine-tenths of a percentage point per year. These data indicate that the program is locating and working with slightly fewer urban residents than had been previously the case.

Family participation in food stamp program

As of December 1975, 51 percent of the families were participating in the food stamp program (and food distribution program) compared to 38 percent in June 1969. As of September 1977, 49 percent of the families were participating in the food stamp and food distribution programs. One of the subobjectives of the program is to increase the homemaker's ability to manage resources that relate to food including food stamps.

Counties have established family referral systems between food stamp offices to better inform families of the availability of both EFNEP and food stamp programs.

Program decreases no serving category in four food groups

An effort is made to get homemakers to eat food from all the food groups. In all food groups (fruit/vegetables, bread/cereals, milk and meat) and at all reporting periods, the proportion of homemakers reporting no servings is lower after 24 months of program participation than it was at program entry.

The greatest advances have been made in the "fruit and vegetable" and "bread and cereals" food groups where decrease has averaged between 70 and 75 percent. For the "milk" and "meat" groups, the average decrease has been about 60 percent. In the "vegetable and

fruit" group, there has been a fairly consistent upward trend in the percentage decrease of homemakers reporting no servings. This indicates that EFNEP is increasingly effective in inducing homemakers with a lack of vegetables and fruits in their diets to include these foods in their meals.

Increase in the proportion of program homemakers with minimal diets

The effectiveness of the program in changing food consumption practices is viewed in two ways. First, the percentage of homemakers who have one serving of food daily from each of the four food groups (milk, meat, fruit/vegetables, and bread/cereals). As a reference of measure, let's refer to this as a minimal diet.

The proportion of homemakers with minimal diets is about 50 percent higher than the proportion of homemakers with such diets at program entry. In March 1978, 51.8 percent of the program homemakers reported a minimal diet on food recall No. 1. Of those homemakers for which a food recall No. 5 was completed (indicating about 24 months of program participation), the corresponding figure was 76.6 percent. Thus, about half of the program homemakers have minimal diets when they enter EFNEP; after 24 months of participation, about three-quarters report diets including at least one serving from each food group.

Increase in the proportion of program homemakers with adequate diets

The second measure of effectiveness is the proportion of homemakers with adequate diets (two servings of milk and meat, and four servings of fruit/vegetables and bread/cereals). After 24 months of participation in EFNEP adequate diets are about four times higher than the proportion with such diets upon program entry. Since December 1972, the program has increased the proportion of participants whose diets have been changed from no serving to minimal or adequate. For March 1978, the index of improvement is about 60 percent higher than the average index for the previous 10 reporting periods.

Increase in proportion of program homemakers with adequate servings in individual food groups

In all food groups and at all reporting intervals, the proportion of homemakers reporting adequate servings is higher after 24 months of program participation than it was at program entry. Average percent increases for the four food groups for reporting intervals from December 1972 through March 1978 have been:

	Percent
Vegetables and fruits group-----	126. 16
Milk group-----	76. 12
Breads and cereals group-----	45. 90
Meat group-----	15. 52

The most striking gains have been in the "vegetables and fruits" group, where the proportion has more than doubled. In this food group there has also been a moderately consistent upward trend of about 8 percentage points per year. This indicates that EFNEP is increasingly effective in changing program homemaker eating patterns to include adequate servings of fruits and vegetables.

*Increase in the proportion of program homemakers with adequate diets:
Food stamp recipients versus nonfood stamp recipients*

The increase in the proportion of program homemakers with adequate diets has been greater for the food stamp group than for the nonfood stamp group. For the food stamp group, the increase has averaged 392 percent for the last three reporting periods. For the nonfood stamp group, the increase has averaged 297 percent. This difference may be at least partially explained by the fact that homemakers in the food stamp group have less adequate diets at program entry than have those in the nonfood stamp group.

Youth participation

Approximately 3.5 million youth have participated in food and nutrition activities. Youth participating were first reported in March 1970 (following allocation of funds for youth professionals to promote 4-H type activities). There has been a definite cycle in youth participation. Consistently the June reporting period has been 15 percent higher than the December reporting period. This situation is probably explainable with the greater likelihood of bad weather during the winter months; greater opportunity for activities for youth during the summer months, and the competition from Christmas activities during December.

A variety of methods are used in teaching youth. The North Carolina study showed that informal teaching/learning setting in the home and community center effected the greatest nutrition behavior change in youth participants. The Mulligan Stew television series showed positive change in knowledge and food preference when nutrition education is taught in a setting where learning is reinforced by involvement of youth, and where supplemental materials such as workbooks, comic books, and nutrition games are used, and where youth have an opportunity to interact with the "teacher."

Age of youth participants

More than 50 percent of the youth participation is in the 9- to 13-year-old group. Participation in less than 9-year-old group has gradually increased. Educational material developed by national task forces has encouraged the participation of 9 to 14 and 14 and older age groups.

Racial/ethnic participation in the program, 1977

Currently 61 percent of the adult participation is minority compared to 70 percent in March 1969. The percent of homemakers who are white has steadily risen from 29 percent in 1969 to about 39 percent today. Black homemakers have dropped over the same period from 54 percent to 44 percent. This shift from black to white is 10 percent. Participants of Hispanic origin have fluctuated slightly around 12-15 percent and is currently 15 percent. Other (including American Indian—1.6 percent; Oriental—0.3 percent; and other—0.4 percent) consistently makes up 2 to 3 percent of the total.

Fifty percent of the youth participating in the EFNEP youth program are white. There has also been a gradual shift in youth partici-

pation from black to white. Among youth participants at the end of September 1977, 50 percent were white; 38.7 percent black; 8.5 percent Hispanic; and less than 2 percent in other racial categories.

Families per full-time equivalent aide

As of September 1977, 5,673 (4,658 full-time equivalent) paraprofessional nutrition aides were employed in the program. One good measure of the efficiency of the adult component of the EFNEP is the number of program families per full-time equivalent aide. The number of families per aide rose steadily through June 1974, and remained relatively constant until September 1977. At this point, the number of program homemakers per FTE aide dropped to just over 45, a value about 10 percent lower than the average of the previous 15 reporting periods. The effect of the change is unknown. Subsequent measurements will indicate whether the drop represents a true degradation of program efficiency, or is simply the result of the change in report periods. There are several factors which may have contributed to the number of families. First, the utilization of the progression model tool (which provides for more adequate assessment of the homemaker's food behavior practices) may have results in aides concentrating on a smaller number of families at any one time. This teaching pattern may result in families achieving the objective in a shorter period of time, thus providing opportunity for more families to enter the program. Secondly, the implementation of paraprofessionals in the youth program in 1977 may have temporarily affected the amount of time aides were spending with families. The third factor is the number of hours an aide is employed. It may not be possible for a 20-hour aide to work with half as many families as a 40-hour aide. Increased costs of operation and inflation have caused States to reduce many aides' employment to 20 hours per week.

With the implementation of the progression model in 1976, emphasis has been to cycle families through the program more quickly. The data from the reporting period following the implementation showed program families being turned over at a higher rate.

The percentage of program homemakers added to the program in September 1977 was 55.9 percent. The percentage of families dropped from the program increased substantially in September, reaching 70.77 percent.

Volunteers

Volunteers are recruited from all socioeconomic groups to work with EFNEP. About 60 percent of the volunteers are from the low-income audience; many are graduated EFNEP homemakers.

During the last 15-month reporting period, 78,000 volunteers extended the efforts of the Extension professionals. Fifty-two thousand (52,265—61 percent) served as teachers and organizational leaders in the youth program. The ratio of youth to volunteers is 10 to 1. Seventeen thousand (17,511—22.4 percent) assisted with the adult program, while 8,000 (8,261—10.6 percent) worked with both youth and adults.

The greatest service provided by volunteers related to the adult program is "bridging the education gap" from EFNEP to other Extension learning situations. The impact of this contribution, however, is not in EFNEP volunteers, but in our total Extension program.

Racial/ethnic participation of aides and volunteers

The racial/ethnic composition of the aides has changed slightly over the life of the program, showing a similarity to that of program families. About 48 percent (47.7 percent) of the aides are white, 39 percent (39.3 percent) are black, 10.7 percent are Hispanic, and 2.3 percent are American Indian and orientals.

As of September 1977, about 55 percent (55.21 percent) of the volunteers were white. The percentage of black volunteers was 35.9 and has remained stable since 1972. Hispanic volunteer participation was 7.4 percent, with other, including American Indian and oriental, accounting for 1.5 percent.

Poverty

"EFNEP is a program that works." It has improved the diets of families by getting them to eat a variety of foods, a balanced diet, and by increasing their fruit/vegetable and milk intake. It has taught families to plan menus and buy more nutritious diets with less money and to use their food stamps more wisely. Through the nutrition aides' encouragement, families have increased their food resources by enrolling in the food stamp program and growing a garden.

Families have been taught the importance of eating a good diet and feeding their family more nutritious meals; and how to prepare and serve more adequate meals; and to improve their storage, safety, and sanitation practices.

Yes, EFNEP has made a real difference in the lives of the enrolled families. It is difficult to know or to measure the other changes that take place in families as a result of the program. Many homemakers have been motivated to further their education, finish high school, and train for employment. Many homemakers have been inspired and have changed their outlook on life. As one homemaker told me, "I now care." They have become involved in school and community activities. Others have left welfare rolls and Aid to Dependent Children. Many children have been returned or not removed from their home situations. There are many documented stories of graduated homemakers that served as volunteers and later employed as nutrition program aides, completed college, and now are employed as Extension home economists.

With the status of poverty remaining constant at 5.3 million, a perpetual audience is in need of nutrition education. Poor diets exist mainly because of one major factor, the lack of understanding of the importance of good nutrition. The Nation has in EFNEP a delivery system with a capability of changing the nutrition status of those families that have the greatest need—the low-income family.

THE COST OF RAISING FARM CHILDREN

(By Carolyn S. Edwards, Family Economist, and Bruce Gray, Mathematical Statistician, Science and Education Administration, USDA)

Estimates of the cost at four levels of raising farm children from birth to age 18 have been developed on the basis of data from the 1973 Farm Family Living Expenditure Survey (FFLES) (7, 9). Total and annual costs in 1977 average prices are provided by age and sex for eight budget components: Food at home, food away from home, housing, transportation, clothing, medical care, education, and all other items. The four levels correspond to levels of expenditure consistent with the four USDA food plans.

The estimates do not include costs for the birth of the child or for college. Although emphasis is placed on out-of-pocket expenditures, the estimates do take into account the value of services from owned motor vehicles, the value of home-produced food, and the value of services from housing owned or received as pay. They do not, however, represent the total consumption costs involved in raising a child. For example, the estimates do not reflect family consumption that might be attributed to stocks of durables, past expenditures, income-in-kind, gifts, or the value of community services. Similarly, no account is made for the value of personal services performed by family members or for the value of earnings foregone in time spent raising children.

Estimates based on the 1973 data appear in tables 1 and 2. These figures were updated to 1977 average price levels by use of the Consumer Price Index groups appropriate to each budget component (table 3). The final estimates in 1977 dollars appear in table 4.

1977 ESTIMATES

Estimates of the total cost of raising a farm child from birth to age 18, in constant 1977 dollars, are around \$27,000 at the thrifty level, \$38,700 at the low level, \$58,700 at the moderate level, and \$88,500 at the liberal level (table 4). Total costs are higher for boys than for girls, primarily because estimated transportation costs are higher for teenage boys and are not offset for girls in other budget components.

Annual costs generally rise with the age of the child. No substantial difference in annual costs by sex shows up until later years when estimates for boys are higher than for girls, again, primarily due to higher transportation costs. Annual costs for boys range from around \$1,200 to \$2,000 at the thrifty level, \$1,700 to \$2,800 at the low level, \$2,400 to \$4,300 at the moderate level, and \$3,600 to \$6,200 at the liberal level. Annual costs for girls range from around \$1,200 to \$1,700 at the thrifty level, \$1,700 to \$2,500 at the low level, \$2,500 to \$3,900 at the moderate level, and \$3,700 to \$5,800 at the liberal level.

The child's estimated share of family housing is the most costly item in the child rearing cost estimates, accounting for between 35 and 40 percent, depending on cost level (table 5). Food at home and transportation are generally second and third highest, followed by education, medical care, and the all-other category. Estimated costs of clothing and food away from home represent the smallest portions of the cost of raising a farm child.

The share of the cost of raising a child represented by the different components of the budget differs by cost level (table 5). At the lower levels, the proportions reflect the relative importance of necessary items. For example, at the thrifty level, food and housing account for more than two-thirds of the total costs, while education—in which such optional items as special lessons, private schools, and extra books and supplies predominate—was estimated as zero. At the higher cost levels, estimated costs for housing and food at home, and, to a lesser degree, for medical care and transportation, account for a smaller share of the total than at the lower levels. At the liberal level, education and the all-other component take on considerably more importance.

USE AND INTERPRETATION OF THE ESTIMATES

Earlier USDA estimates of the cost of raising a child released in 1970-71 (4, 8) and based on the 1960-61 Survey of Consumer Expenditures (CES) are frequently requested not only as standard budget guidance materials for families but also as input into research, judicial decisions on child support, and guides for public welfare allowances. In order that these estimates continue to serve the needs of diverse users, these research-based materials needed revision according to the most recent data available and methodology that reflects, to the extent possible, the potential uses for the final estimates.

Surveys such as the FFLES and the CES are at present the only sources of data that provide necessary detail for the development of these budgets and that are representative of the U.S. population. These cross-section studies provide considerable detail on family income and expenditures and include information on the sex, age, occupation, and marital status of each family member. The nature of these data bases, however, does present some problems that should be considered in the use and interpretation of the estimates.

Unfortunately, data bases that are sufficiently large and detailed to show changes in household characteristics and expenditure patterns are compiled infrequently. For example, these estimates for farm children are based on expenditure patterns and characteristics of farm families in 1973. Estimates based on these data may be adjusted to reflect price changes, but to the extent that families change their allocation of total resources, or change their allocation of resources among components of child rearing costs, these estimates reflect only those patterns as captured by the data in 1973, and not changes that have taken place since that time.

In addition, even with very large data bases, sample size limits the extent to which family characteristics are represented and may be taken into account. Once the sample is partitioned by several characteristics such as age and sex of the child, the limits for reliable estimates are quickly reached. The examination of special circumstances

such as single-parent families or foster children, therefore, may not be feasible.

The estimates are based on cross-section data that present a picture of the characteristics of the population at one point in time. The total cost figures from birth to age 18 as presented in table 4, therefore, do not reflect the change in level and mix of goods and services available or consumed by one household as a result of changes in prices, income, or preferences experienced as the child grows up. Instead, the grand totals represent the experience and behavior of different families with children at various ages.

For convenience, the grand total figures are expressed in constant 1977 dollars and assume that the child progresses through the 18 years at 1977 price levels. For many uses, comparisons in constant dollars are appropriate. The grand total can also be computed, however, by use of current prices for each year. For example, the total cost in current dollars of raising a farm boy born in 1960 at the moderate cost level until he reached 18 in 1977 would have been \$40,196 (table 6) compared to the figure in constant 1977 dollars from table 4 of \$59,414. The lower figure takes into account changes in price levels for the different components of the budget as they occurred from 1960 to 1977 by updating and backdating the 1973 estimates by use of the appropriate Consumer Price Index for each budget component (table 3).

Depending on the use of the total cost figures, other adjustments can be made. For example, if concern were with projecting costs to be incurred over the life of a child born in 1975, the 1973 annual figures for the infancy year could be updated by use of the 1975 price indexes, the annual figures for age 1 could be adjusted by use of the 1976 indexes, the figures for age 2 could be taken as is for 1977, and subsequent years could be inflated by use of some projected price change assumptions for future years. A total could then be calculated that would reflect the experienced and expected price changes over the life span of the particular child.

Consideration also could be made for changes in family level of living over the life cycle by combining figures at different cost levels. For example, it might be assumed that a child was raised for several years at one cost level and for other years at another cost level.

It is important that users of the estimates understand the characteristics inherent in the data source and the derivation of the figures. Users should consider basic limitations of the data, but also should recognize that limitations are balanced by the breadth and representativeness that can only be provided by these nationwide, cross-section samples of the population.

Users should also realize that although the estimates presented here followed an overall approach similar to the approaches of earlier USDA studies (1, 2, 4), some changes in data collection, definition of variables, and estimation procedures were inevitable, or in some cases, desirable. For example, it was not possible to compute regional estimates with the 1973 FFLES data. In addition, changes were made to reflect new uses of the estimates. Therefore, present and earlier estimates generally are not directly comparable.

METHODOLOGY

Sample

The estimates were developed from survey data collected in 1973 and early 1974 by the Economics, Statistics, and Cooperatives Service (ESCS), formerly the Statistical Reporting Service of the USDA (7, 9). The Farm Family Living Expenditure Survey (FFLES) was designed as a comprehensive study of the expenditures of farm operators' families. The self-weighting sample of 2,621 families provided data on family characteristics, expenditures, and income.

Estimates for the cost of raising a child were derived by use of data from 34 subsamples of this total sample. Each subsample included only those families with members of the age-sex category for which estimates were being computed. For example, data on the 242 families with infants under 2 years were used to develop clothing estimates for infants under 2. Thus, the size, age-sex composition, and expenditure patterns of the families with members in the given category form the basis of the estimates.

Levels of the budgets

The levels of the estimates reflect levels of living of families whose food expenditures correspond to the four USDA food plans (5). The work of Engel examining the relationship between well-being and the proportion of total expenditures devoted to food underlies the use of the food plans as a benchmark for the levels of the budgets (3). The application assumes that families who spend at similar cost levels on food, allowing for differences in family size and composition, live at similar levels. These levels are, in turn, reflected in other areas of consumption. The food plans are based on actual food consumption habits, as well as on standards of nutritional adequacy, and indicate amounts and costs of 11 groups of foods that together provide an adequate diet for individuals of a specified age and sex. An advantage of the use of food as a benchmark for indicating level of living is that food is the one category of consumption for which scientific standards of adequacy are available. The use of the food plans also allows consideration of differences in family size and composition, which is not possible with income, the more common indicator of level of living.

Estimation procedure

Estimates of each budget component except food at home were computed for each age-sex subsample, by use of multiple regression procedures. The functional relationships were:

$$\text{Equation 1: } F=f(P,S)$$

$$\text{Equation 2: } X=f(P,S)$$

The terms of the equations were defined as follows:

F =the value of food consumed by the family, adjusted to the food plan concept. This included food at home, food away from home, and home produced food. The food plan concept assumes all meals are provided from food purchased for home consumption (5). However, most families in the sample ate some meals away from home or from home-produced foods. Such food generally does not substitute for the value of food purchased for home use on a dollar-for-dollar basis. The adjusted value of food consumed

by the family, therefore, included only that portion of expenditures on food eaten away from home and the value of home-produced food that was estimated to substitute for food that otherwise would have been purchased for home consumption.

P = the value of family living expenditures representing the normal level of living. This included the sum of those items generally unaffected by short-term changes in income: Food, housing, transportation, education, clothing, personal care, gifts and contributions, personal insurance, upkeep, and miscellaneous expenditures. Automobile and home purchases, taxes, and major medical expenditures were not included.

S = family size.

X = per child expenditures, specific to age and sex, on the individual budget component to be estimated. Estimates were computed separately for food away, housing, transportation, medical care, clothing, education, and all other items.

The estimates were developed by use of a two-step procedure. In the first step, a value of P was derived at each of the average food plan costs and the average family size specific to the age-sex subsample, based on the curvilinear relationship determined from equation 1. In the second step, an estimated value for each of the budget components was derived at the average family size and four levels of P from step 1, based on the linear relationship determined from equation 2.

Budget components

A major stage in the development of the estimates was to obtain, from the FFLES data, expenditures for each child in the family, by age and sex. Only those expenditures for children age 17 and under were included. This required that expenditures for parents and older children be separated out as accurately as possible.

Ideally, cost estimates would have been made for each year of age. However, because of sample size, estimates could only be made for ranges in age. For each budget component, therefore, children's age-sex categories had to be defined in such a way as to reflect observed differences in consumption that accompany differences in physiological and social needs, or to reflect the share of family expenditures that can appropriately be attributed to a family member of a given age and/or sex. Because the pattern of these differences varies among budget components, the age-sex categories were defined differently for each component. For example, the age-sex categories for food reflect changes in nutritional needs as a child matures, whereas those for clothing reflect changes in needs associated not only with physical growth, but major changes associated with social activity as well. For transportation, analyses indicated that a greater share of family expenditures could be attributed to children who had reached driving age than to those who had not. Ideally, little variation in consumption of the budget component should be evident within age-sex groups, while important variation should be reflected between them.

For some budget components, such as clothing, the survey data were available only on expenditures for family members identified by very broad age-sex categories. For other components, such as housing and transportation, the survey data were available only on costs for the family as a whole. Each individual child's share of such observed costs had to be developed.

Food at home.—Estimates for food at home were developed from the USDA food plans for 1973 rather than from the FFLES data. Because the thrifty food plan had not been developed in 1973, the thrifty level was computed as 80 percent of the low-cost level.

The food plans are amounts of food for individuals of different ages and sex at four cost levels. They provide estimates for 11 age-sex categories appropriate for children up to age 18. These plans assume all meals are eaten at home. However, in this study estimates were developed for the cost of food away from home. In order to avoid double counting, the food plan figures were reduced by the proportion of estimated costs for food away that, according to separate analyses, substituted for costs of food at home. In order to reflect the average size of FFLES families with members of each given age-sex category, the food plan estimates were adjusted by economy of scale figures provided with the food plans (5).

Food away from home.—These estimates were based on the child's share of family expenditures for meals away from home other than those at work. No estimates were made for children under age 3. Total family expenditures on food away were divided among family members by assuming that family members would consume the same proportion of the family food away from home as of food at home.

Housing.—Family housing costs included two parts: Out-of-pocket expenditures for items such as fuel, utilities, second homes, furniture, equipment, and service contracts; and a housing services portion that consisted of an estimated annual rental value for owners, rent paid for renters, and an estimated reasonable annual rental value for those who received their housing without full expenditure. Total family housing costs were divided equally among family members.

Transportation.—Transportation costs for the family included current expenses such as vehicle operation, service, and maintenance; public transportation; and an annual value of consumption of owned vehicles defined as the purchase price divided by estimated average service life of the vehicle. For purposes of determining proportions of family costs to be allocated to each child, three age-sex categories were used: Children 13 and under, boys 14 through 17, and girls 14 through 17. The age of 14 appeared to be an appropriate dividing age for farm children who may be licensed to drive in some States at that age. Total family transportation costs were then allocated to individuals by use of proportions developed for each family that reflected its size and age-sex composition. The values used in these proportions were obtained from data on the entire sample by a multiple regression procedure that related observed total family transportation costs to the size of the family and the number of family members in each of the age-sex categories.

Clothing.—Data on clothing expenditures from the FFLES were collected on 95 clothing items. In order to make estimates of clothing more manageable and reliable, and yet retain detail, these 95 items were reduced to 6 clothing categories by combining similar items: Wraps, outerwear, under- and nightwear, hosiery, footwear, and hats and all-other items.¹

¹ Children's clothing budgets are available not only for the annual costs by age and sex as shown in table 4, but also for the six clothing categories (6). The totals in table 4 were derived by individually updating the 1973 clothing component estimates in table 2 with the appropriate indexes from table 3; rounding; and then adding.

Earlier analyses on patterns of clothing consumption lead to the development of 11 age-sex categories for children that reflect changes in physiological and social needs. Data from the FFLES, however, were collected only for five age-sex categories: Infants under 2, females 2 through 15, males 2 through 15, females 16 and over, and males 16 and over. Observed expenditures in these broad age-sex categories thus had to be divided among the 11 categories developed for these estimates. Expenditures on females 2 through 15 were apportioned to girls 2 through 6, 6 through 9, 10 through 13, and 14 through 15. Expenditures for girls 16 through 17 had to be apportioned from observed totals for females 16 and over. The same was necessary for boys. To divide the expenditures reported for the broad age-sex categories among family members, proportions were developed for each family that reflected its age-sex composition. The values used in these proportions were obtained from data on the entire sample by use of a multiple regression procedure that related observed expenditures in the broad age-sex categories to the number of family members in each of the new categories.

Medical care.—Estimates of the cost of medical care for children were based on family medical and dental expenditures that included net expenditures for health insurance, hospital and physicians' services, eye care, prescriptions, and medical supplies. Medical costs were divided among family members on a proportionate basis corresponding to data on the average distribution of health care expenditures by age-sex categories (10) and the age-sex composition of the family. Family dental expenses were divided equally among family members over 2 years of age.

Education.—Expenditures on education included tuition; books and supplies; fees; and (for children not living at home) transportation, food, and housing expenses while attending school. Estimates were based on families whose oldest child was at least 6 but not older than 17. This limitation was imposed in order to exclude educational expenses for parents or older children attending college. Expenses were divided equally among the children aged 6 through 17.

All other.—The all-other category included family expenditures on such items as gifts and contributions; sewing materials and laundry expenses; miscellaneous recreational and entertainment expenses; and interest, service, and other transaction costs. These expenditures were divided equally among family members. Male personal expenses were divided among the males in the family and female personal expenses among the females.

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TABLE 1.—COST OF RAISING FARM CHILDREN FROM BIRTH TO AGE 18, AT 4 COST LEVELS, BY AGE AND SEX: 1973 ANNUAL COSTS¹

[In dollars]

Age of child (years)	Food at home		Food away from home		Housing		Transportation		Clothing ²		Medical care		Education		All other	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Thrifty level:																
Less than 1	175.05	175.05	0	0	424.0168	424.0168	81.9974	81.9974	81.9974	81.9974	87.3484	66.9740	0	0	61.8530	80.6636
1	222.66	222.66	0	0	424.0168	424.0168	81.9974	81.9974	81.9974	81.9974	87.3484	66.9740	0	0	61.8530	80.6636
2	222.66	222.66	0	0	424.0168	424.0168	81.9974	81.9974	81.9974	81.9974	75.3080	59.2278	0	0	61.8530	80.6636
3	257.3848	257.3848	14.0116	14.0116	424.0168	424.0168	81.9974	81.9974	81.9974	81.9974	75.3080	59.2278	0	0	61.8530	80.6636
4	257.3848	257.3848	14.0116	14.0116	424.0168	424.0168	81.9974	81.9974	81.9974	81.9974	75.3080	59.2278	0	0	61.8530	80.6636
5	257.3848	257.3848	14.0116	14.0116	424.0168	424.0168	81.9974	81.9974	81.9974	81.9974	75.3080	59.2278	0	0	61.8530	80.6636
6	306.8589	306.8589	22.2435	22.2435	424.0168	424.0168	81.9974	81.9974	81.9974	81.9974	73.5037	66.5993	0	0	61.8530	80.6636
7	306.8589	306.8589	22.2435	22.2435	424.0168	424.0168	81.9974	81.9974	81.9974	81.9974	73.5037	66.5993	0	0	61.8530	80.6636
8	306.8589	306.8589	22.2435	22.2435	424.0168	424.0168	81.9974	81.9974	81.9974	81.9974	73.5037	66.5993	0	0	61.8530	80.6636
9	356.6880	352.4326	23.1639	13.6504	424.0168	424.0168	81.9974	81.9974	81.9974	81.9974	73.5037	66.5993	0	0	61.8530	80.6636
10	356.6880	352.4326	23.1639	13.6504	424.0168	424.0168	81.9974	81.9974	81.9974	81.9974	73.5037	66.5993	0	0	61.8530	80.6636
11	423.7964	384.6445	11.7039	20.1180	424.0168	424.0168	81.9974	81.9974	81.9974	81.9974	73.5037	66.5993	0	0	61.8530	80.6636
12	423.7964	384.6445	11.7039	20.1180	424.0168	424.0168	81.9974	81.9974	81.9974	81.9974	73.5037	66.5993	0	0	61.8530	80.6636
13	423.7964	384.6445	11.7039	20.1180	424.0168	424.0168	287.8960	189.1603	81.9974	81.9974	73.5037	66.5993	0	0	61.8530	80.6636
14	423.7964	384.6445	11.7039	20.1180	424.0168	424.0168	287.8960	189.1603	81.9974	81.9974	73.5037	66.5993	0	0	61.8530	80.6636
15	484.7605	391.5244	35.6552	35.5119	424.0168	424.0168	287.8960	189.1603	81.9974	81.9974	73.5037	66.5993	0	0	61.8530	80.6636
16	484.7605	391.5244	35.6552	35.5119	424.0168	424.0168	287.8960	189.1603	81.9974	81.9974	73.5037	66.5993	0	0	61.8530	80.6636
17	484.7605	391.5244	35.6552	35.5119	424.0168	424.0168	287.8960	189.1603	81.9974	81.9974	73.5037	66.5993	0	0	61.8530	80.6636
Low level:																
Less than 1	218.82	218.82	0	0	578.9485	578.9485	112.3866	112.3866	112.3866	112.3866	95.1596	80.7708	0	0	168.5408	184.8291
1	278.32	278.32	0	0	578.9485	578.9485	112.3866	112.3866	112.3866	112.3866	95.1596	80.7708	0	0	168.5408	184.8291
2	278.32	278.32	0	0	578.9485	578.9485	112.3866	112.3866	112.3866	112.3866	94.0410	81.0682	0	0	168.5408	184.8291
3	314.0322	314.0322	35.8457	35.8457	578.9485	578.9485	112.3866	112.3866	112.3866	112.3866	94.0410	81.0682	0	0	168.5408	184.8291
4	314.0322	314.0322	35.8457	35.8457	578.9485	578.9485	112.3866	112.3866	112.3866	112.3866	94.0410	81.0682	0	0	168.5408	184.8291
5	314.0322	314.0322	35.8457	35.8457	578.9485	578.9485	112.3866	112.3866	112.3866	112.3866	94.0410	81.0682	0	0	168.5408	184.8291
6	379.9177	379.9177	36.5407	36.5407	578.9485	578.9485	112.3866	112.3866	112.3866	112.3866	90.6959	83.4343	61.3115	61.3115	168.5408	184.8291
7	379.9177	379.9177	36.5407	36.5407	578.9485	578.9485	112.3866	112.3866	112.3866	112.3866	90.6959	83.4343	61.3115	61.3115	168.5408	184.8291
8	379.9177	379.9177	36.5407	36.5407	578.9485	578.9485	112.3866	112.3866	112.3866	112.3866	90.6959	83.4343	61.3115	61.3115	168.5408	184.8291
9	437.4761	431.0710	48.9166	39.6100	578.9485	578.9485	112.3866	112.3866	112.3866	112.3866	90.6959	83.4343	61.3115	61.3115	168.5408	184.8291
10	437.4761	431.0710	48.9166	39.6100	578.9485	578.9485	112.3866	112.3866	112.3866	112.3866	90.6959	83.4343	61.3115	61.3115	168.5408	184.8291
11	517.7185	471.9968	43.2657	46.1446	578.9485	578.9485	112.3866	112.3866	112.3866	112.3866	90.6959	83.4343	61.3115	61.3115	168.5408	184.8291
12	517.7185	471.9968	43.2657	46.1446	578.9485	578.9485	112.3866	112.3866	112.3866	112.3866	90.6959	83.4343	61.3115	61.3115	168.5408	184.8291
13	517.7185	471.9968	43.2657	46.1446	578.9485	578.9485	369.8235	242.5143	61.3115	61.3115	90.6959	83.4343	61.3115	61.3115	168.5408	184.8291
14	517.7185	471.9968	43.2657	46.1446	578.9485	578.9485	369.8235	242.5143	61.3115	61.3115	90.6959	83.4343	61.3115	61.3115	168.5408	184.8291
15	556.4502	484.8162	67.1892	55.3167	578.9485	578.9485	369.8235	242.5143	61.3115	61.3115	90.6959	83.4343	61.3115	61.3115	168.5408	184.8291
16	556.4502	484.8162	67.1892	55.3167	578.9485	578.9485	369.8235	242.5143	61.3115	61.3115	90.6959	83.4343	61.3115	61.3115	168.5408	184.8291
17	556.4502	484.8162	67.1892	55.3167	578.9485	578.9485	369.8235	242.5143	61.3115	61.3115	90.6959	83.4343	61.3115	61.3115	168.5408	184.8291

Moderate level:		275.26	275.26	0	0	818.4082	818.4082	156.6183	156.6183	105.4854	108.0597	0	0	333.0601	357.6785
Less than 1...		350.87	350.87	0	0	818.4082	818.4082	156.6183	156.6183	105.4854	108.0597	0	0	333.0601	357.6785
1	2	350.87	350.87	0	0	818.4082	818.4082	156.6183	156.6183	105.4854	108.0597	0	0	333.0601	357.6785
2	3	350.87	350.87	0	0	818.4082	818.4082	156.6183	156.6183	105.4854	108.0597	0	0	333.0601	357.6785
3	4	396.4492	396.4492	67.1155	67.1155	818.4082	818.4082	156.6183	156.6183	116.5620	109.5776	0	0	333.0601	357.6785
4	5	396.4492	396.4492	67.1155	67.1155	818.4082	818.4082	156.6183	156.6183	116.5620	109.5776	0	0	333.0601	357.6785
5	6	396.4492	396.4492	67.1155	67.1155	818.4082	818.4082	156.6183	156.6183	116.5620	109.5776	0	0	333.0601	357.6785
6	7	483.4131	483.4131	59.4831	59.4831	818.4082	818.4082	156.6183	156.6183	118.5098	108.6743	275.3450	275.3450	333.0601	357.6785
7	8	483.4131	483.4131	59.4831	59.4831	818.4082	818.4082	156.6183	156.6183	118.5098	108.6743	275.3450	275.3450	333.0601	357.6785
8	9	483.4131	483.4131	59.4831	59.4831	818.4082	818.4082	156.6183	156.6183	118.5098	108.6743	275.3450	275.3450	333.0601	357.6785
9	10	559.6521	559.6521	50.1580	50.1580	818.4082	818.4082	156.6183	156.6183	118.5098	108.6743	275.3450	275.3450	333.0601	357.6785
10	11	559.6521	559.6521	50.1580	50.1580	818.4082	818.4082	156.6183	156.6183	118.5098	108.6743	275.3450	275.3450	333.0601	357.6785
11	12	673.2126	673.2126	61.1150	61.1150	818.4082	818.4082	156.6183	156.6183	118.5098	108.6743	275.3450	275.3450	333.0601	357.6785
12	13	673.2126	673.2126	61.1150	61.1150	818.4082	818.4082	156.6183	156.6183	118.5098	108.6743	275.3450	275.3450	333.0601	357.6785
13	14	673.2126	673.2126	61.1150	61.1150	818.4082	818.4082	156.6183	156.6183	118.5098	108.6743	275.3450	275.3450	333.0601	357.6785
14	15	743.7612	743.7612	609.5708	130.6048	818.4082	818.4082	517.5557	351.6755	118.5098	108.6743	275.3450	275.3450	333.0601	357.6785
15	16	743.7612	743.7612	609.5708	130.6048	818.4082	818.4082	517.5557	351.6755	118.5098	108.6743	275.3450	275.3450	333.0601	357.6785
16	17	743.7612	743.7612	609.5708	130.6048	818.4082	818.4082	517.5557	351.6755	118.5098	108.6743	275.3450	275.3450	333.0601	357.6785
Liberal level:		306.96	306.96	0	0	1,234.5325	1,234.5325	230.8509	230.8509	122.3574	144.5154	0	0	633.9497	671.2629
Less than 1...		320.93	420.93	0	0	1,234.5325	1,234.5325	230.8509	230.8509	122.3574	144.5154	0	0	633.9497	671.2629
1	2	320.93	420.93	0	0	1,234.5325	1,234.5325	230.8509	230.8509	122.3574	144.5154	0	0	633.9497	671.2629
2	3	456.0178	456.0178	125.5413	125.5413	1,234.5325	1,234.5325	230.8509	230.8509	168.7223	174.7623	0	0	633.9497	671.2629
3	4	456.0178	456.0178	125.5413	125.5413	1,234.5325	1,234.5325	230.8509	230.8509	168.7223	174.7623	0	0	633.9497	671.2629
4	5	456.0178	456.0178	125.5413	125.5413	1,234.5325	1,234.5325	230.8509	230.8509	168.7223	174.7623	0	0	633.9497	671.2629
5	6	593.9609	593.9609	97.9379	97.9379	1,234.5325	1,234.5325	230.8509	230.8509	168.7223	174.7623	0	0	633.9497	671.2629
6	7	593.9609	593.9609	97.9379	97.9379	1,234.5325	1,234.5325	230.8509	230.8509	168.7223	174.7623	0	0	633.9497	671.2629
7	8	593.9609	593.9609	97.9379	97.9379	1,234.5325	1,234.5325	230.8509	230.8509	168.7223	174.7623	0	0	633.9497	671.2629
8	9	662.4355	613.0562	132.9171	165.4436	1,234.5325	1,234.5325	230.8509	230.8509	158.9805	151.6622	525.3372	525.3372	633.9497	671.2629
9	10	662.4355	613.0562	132.9171	165.4436	1,234.5325	1,234.5325	230.8509	230.8509	158.9805	151.6622	525.3372	525.3372	633.9497	671.2629
10	11	662.4355	613.0562	132.9171	165.4436	1,234.5325	1,234.5325	230.8509	230.8509	158.9805	151.6622	525.3372	525.3372	633.9497	671.2629
11	12	771.7527	725.8313	170.3579	137.5829	1,234.5325	1,234.5325	230.8509	230.8509	158.9805	151.6622	525.3372	525.3372	633.9497	671.2629
12	13	771.7527	725.8313	170.3579	137.5829	1,234.5325	1,234.5325	230.8509	230.8509	158.9805	151.6622	525.3372	525.3372	633.9497	671.2629
13	14	771.7527	725.8313	170.3579	137.5829	1,234.5325	1,234.5325	230.8509	230.8509	158.9805	151.6622	525.3372	525.3372	633.9497	671.2629
14	15	882.6304	714.6555	189.7714	134.5578	1,234.5325	1,234.5325	694.5703	469.1379	158.9805	151.6622	525.3372	525.3372	633.9497	671.2629
15	16	882.6304	714.6555	189.7714	134.5578	1,234.5325	1,234.5325	694.5703	469.1379	158.9805	151.6622	525.3372	525.3372	633.9497	671.2629
16	17	882.6304	714.6555	189.7714	134.5578	1,234.5325	1,234.5325	694.5703	469.1379	158.9805	151.6622	525.3372	525.3372	633.9497	671.2629
17		882.6304	714.6555	189.7714	134.5578	1,234.5325	1,234.5325	694.5703	469.1379	158.9805	151.6622	525.3372	525.3372	633.9497	671.2629

¹ Budgets were derived from expenditure data from the 1973 Farm Family Living Expenditure Survey, conducted by the Statistical Reporting Service of the USDA. Estimates were based on data from families with members of the corresponding age-sex categories. Thrifty, low, moderate, and liberal budget levels were computed at levels of living which corresponded to family food expenditure at the USDA food plan levels.

² Estimates for clothing are by 6 components in the budget; see table 2. Total clothing figures are arrived at by updating the 6 individual components, rounding to the nearest \$1, and totaling. See table 4.

TABLE 2.—FARM CHILDREN'S CLOTHING BUDGETS AT 4 COST LEVELS BY AGE AND SEX: 1973 ANNUAL COSTS¹
[In dollars]

Age of child (years)	Wraps		Outerwear		Under- and nightwear		Hosiery		Footwear		Hats and all other	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Thrifty level:												
Infants.....	4.2649	4.2649	9.2082	9.2082	24.2628	24.2628	1.7879	1.7879	6.9333	6.9333	0.9809	0.9809
2 to 5.....	5.3619	5.2896	17.3980	10.7047	7.0624	5.8945	1.9978	2.5048	12.6257	9.1601	1.2826	0.8895
6 to 9.....	5.7764	9.8995	21.2106	20.0701	5.4139	7.8282	2.0880	3.8128	14.9627	16.0922	1.1866	3.7423
10 to 13.....	7.7461	12.8655	36.6516	28.4507	7.2354	7.5326	3.2034	5.3841	25.9022	15.6422	4.1361	3.6434
14 to 15.....	10.2019	14.4120	43.0460	33.2687	4.4453	8.8859	3.5135	8.9477	27.4933	19.0890	4.6929	6.6570
16 to 17.....	10.3257	6.2166	39.9425	29.8271	6.7277	7.7417	4.0802	11.1030	26.8145	17.0493	5.2131	8.2015
Low level:												
Infants.....	5.4222	5.4222	15.8364	15.8364	30.3913	30.3913	2.4981	2.4981	9.3268	9.3268	1.1124	1.1124
2 to 5.....	7.2669	6.4934	25.1084	19.9671	9.3324	7.7853	2.8060	3.0228	17.4779	14.8326	1.8876	1.4650
6 to 9.....	8.3216	11.4303	37.7370	34.1841	7.4709	6.3126	3.6021	4.7553	21.2734	20.1321	3.0842	4.4963
10 to 13.....	10.8417	15.5965	56.4889	47.3111	6.6080	12.1107	4.3424	7.8729	31.3825	26.0023	5.4211	6.0399
14 to 15.....	12.6320	16.7859	65.8622	65.1063	5.3301	12.6360	4.4855	10.3383	35.0104	23.9156	7.7710	8.4117
16 to 17.....	11.9480	13.4439	63.9002	61.3996	6.3653	12.2194	4.7768	14.0541	30.7380	23.6386	5.9733	11.5088
Moderate level:												
Infants.....	7.2801	7.2801	26.4769	26.4769	40.2295	40.2295	3.6381	3.6381	13.1692	13.1692	1.3235	1.3235
2 to 5.....	9.3572	8.0693	34.3700	32.0576	9.8953	9.2535	3.7776	3.7883	23.3047	22.2372	2.6510	2.2161
6 to 9.....	11.4353	14.1935	57.9549	60.6864	9.9875	9.1000	5.4789	6.5251	28.9338	27.8906	5.4301	5.9121
10 to 13.....	17.1816	20.2562	69.1418	93.2395	9.4190	18.3332	6.6750	11.2556	42.6368	34.6470	8.0528	9.2974
14 to 15.....	16.9469	20.6315	92.9534	106.9623	9.0445	18.7110	6.0515	12.6434	47.1205	31.7183	12.7998	11.2541
16 to 17.....	14.5035	27.1438	106.9472	121.2641	8.5108	20.7094	6.0105	19.6499	38.7876	36.1325	7.3392	17.7799
Liberal level:												
Infants.....	9.8586	9.8586	41.2446	41.2446	53.8838	53.8838	5.2204	5.2204	18.5020	18.5020	1.6165	1.6165
2 to 5.....	14.8616	11.6679	55.8289	59.7018	13.3956	15.8969	6.0280	5.4040	36.8069	39.1672	4.4191	3.9337
6 to 9.....	16.6834	18.6980	92.0319	104.2056	14.2292	13.6711	8.6421	9.4312	42.0063	40.5322	9.3842	8.2371
10 to 13.....	23.9553	27.2996	91.2267	154.0059	12.6228	28.6221	9.0347	16.8488	54.0121	48.9409	10.7150	14.6835
14 to 15.....	20.9338	24.5203	123.3110	149.2877	12.0861	24.9541	7.8053	14.9541	60.6908	39.6086	18.2866	14.1284
16 to 17.....	18.3657	44.3771	172.0063	196.9689	10.2422	31.3892	7.8751	26.6888	48.4421	51.8488	9.4035	25.6684

¹ Budgets were derived from expenditure data from the 1973 Farm Family Living Expenditure Survey, conducted by the Economics, Statistics, and Cooperatives Service, formerly the Statistical Reporting Service of the USDA. Estimates were based on data from families with members of the

corresponding age-sex categories. Thrifty, low, moderate, and liberal budget levels were computed at levels of living which corresponded to family food expenditure at the USDA food plan levels. The budgets cover costs for garments and footwear, but exclude clothing materials and upkeep.

TABLE 3.—ANNUAL AVERAGE CONSUMER PRICE INDEX DATA FOR UPDATING AND BACKDATING ESTIMATES OF THE COST OF RAISING AND CLOTHING FARM CHILDREN (1967=100)

Budget category	Food at home	Food away from home	Housing	Transportation	Clothing				Medical care	Education	All other
					Infants' garments	Girls' garments	Boys' garments	Footwear			
Consumer Price Index group (year)	Food at home	Food away from home	Housing	Transportation	Clothing				Medical care	Reading and recreation	Personal care, reading and recreation (averaged)
					Apparel commodities	Women's and girls' garments	Mens' and boys' garments	Footwear			
1977	190.2	200.3	189.6	177.2	151.6	146.4	154.0	156.9	202.4	157.9	164.4
1976	179.5	186.1	177.2	165.5	145.8	141.9	147.2	149.9	184.7	151.2	155.8
1975	175.8	174.3	166.8	150.6	141.2	138.1	142.2	144.2	168.6	144.4	147.6
1974	162.4	159.4	150.6	137.7	136.1	134.9	136.4	138.1	150.5	133.8	135.6
1973	141.4	141.4	135.0	123.8	127.1	125.4	126.4	130.2	137.7	125.9	125.6
1972	121.6	131.1	129.2	119.9	122.7	123.0	121.9	124.9	132.5	122.8	121.3
1971	116.4	116.1	124.3	118.6	120.1	120.1	120.3	121.5	128.4	119.3	118.1
1970	113.7	119.9	118.9	112.7	116.5	116.0	117.1	117.7	120.6	113.4	113.3
1969	108.2	111.6	110.8	107.2	111.9	111.7	112.4	118.8	113.4	108.7	109.0
1968	103.2	105.2	104.2	103.2	105.6	105.9	105.7	105.3	106.1	104.5	104.5
1967	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1966	100.3	95.1	97.2	97.2	95.0	95.6	96.5	95.3	93.4	97.5	97.3
1965	95.3	90.9	94.6	95.6	93.6	93.8	96.5	90.3	89.5	95.9	95.6
1964	83.2	86.9	93.8	94.3	92.8	93.1	92.8	88.4	87.3	95.0	94.8
1963	92.2	87.3	92.7	93.0	92.0	91.6	91.6	86.0	85.6	92.8	93.1
1962	91.0	85.4	91.7	92.5	91.2	91.8	90.4	87.1	83.5	89.3	91.8
1961	90.4	83.2	90.9	90.6	90.8	91.9	89.9	85.9	81.4	89.3	90.0
1960	88.6	81.4	90.2	89.6	89.0	91.6	88.9	85.1	79.1	87.3	88.7
1959	88.8	79.3	88.6	89.6	88.0	91.2	87.2	82.2	76.4	83.3	87.0
1958	91.0	77.2	87.7	86.0	88.2	90.8	87.3	79.0	73.2	83.9	85.4
1957	87.2	74.9	86.2	83.3	88.2	90.9	87.8	77.8	69.9	80.7	82.4
1956	84.4	72.2	83.6	78.8	87.3	90.4	86.4	75.4	67.2	77.8	79.5
1955	84.1	70.8	82.3	77.4	85.8	89.8	85.0	71.6	64.8	76.7	77.3
1954	85.8	70.1	81.7	78.3	86.3	89.6	86.0	70.8	63.4	76.9	76.8
1953	86.2	68.9	80.8	79.5	86.7	91.4	86.4	70.0	61.4	77.7	77.0

Source: U.S. Department of Labor, Bureau of Labor Statistics, 1975, Handbook of Labor Statistics 1975—Reference Edition, bulletin No. 1865; and CPI Detailed Reports: December 1975, December 1976, and December 1977 (1976, 1977, and 1978).

TABLE 4.—COST OF RAISING FARM CHILDREN FROM BIRTH TO AGE 18, AT 4 COST LEVELS, BY AGE AND SEX: 1977 ANNUAL COSTS¹

[Dollars]

Age of child (years)	Total		Food at home		Food away from home		Housing		Transportation		Clothing		Medical care		Education		All others	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Thrifty level:																		
Less than 1.....	1,212	1,207	235	235	0	0	595	595	117	117	56	56	128	98	0	0	81	106
1.....	1,276	1,271	299	299	0	0	595	595	117	117	56	56	128	98	0	0	81	106
2.....	1,259	1,244	299	299	0	0	595	595	117	117	56	40	111	87	0	0	81	106
3.....	1,326	1,311	346	346	20	20	595	595	117	117	56	40	111	87	0	0	81	106
4.....	1,326	1,311	346	346	20	20	595	595	117	117	56	40	111	87	0	0	81	106
5.....	1,326	1,311	346	346	20	20	595	595	117	117	56	40	111	87	0	0	81	106
6.....	1,408	1,428	413	413	32	32	595	595	117	117	62	67	108	98	0	0	81	106
7.....	1,408	1,428	413	413	32	32	595	595	117	117	62	67	108	98	0	0	81	106
8.....	1,408	1,428	413	413	32	32	595	595	117	117	62	67	108	98	0	0	81	106
9.....	1,476	1,476	480	474	33	19	595	595	117	117	62	67	108	98	0	0	81	106
10.....	1,514	1,501	480	474	33	19	595	595	117	117	100	92	108	98	0	0	81	106
11.....	1,514	1,501	480	474	33	19	595	595	117	117	100	92	108	98	0	0	81	106
12.....	1,588	1,554	570	517	17	29	595	595	117	117	100	92	108	98	0	0	81	106
13.....	1,588	1,554	570	517	17	29	595	595	117	117	100	92	108	98	0	0	81	106
14.....	1,904	1,729	570	517	17	29	595	595	412	271	121	113	108	98	0	0	81	106
15.....	2,020	1,760	652	527	51	50	595	595	412	271	121	113	108	98	0	0	81	106
16.....	2,012	1,740	652	527	51	50	595	595	412	271	113	93	108	98	0	0	81	106
17.....	2,012	1,740	652	527	51	50	595	595	412	271	113	93	108	98	0	0	81	106
Total.....	27,577	26,494	8,216	7,664	459	450	10,710	10,710	3,286	2,722	1,452	1,320	1,996	1,720	0	0	1,458	1,908
Low level:																		
Less than 1.....	1,705	1,705	294	294	0	0	813	813	161	161	76	76	140	119	0	0	221	242
1.....	1,785	1,785	374	374	0	0	813	813	161	161	76	76	140	119	0	0	221	242
2.....	1,783	1,772	374	374	0	0	813	813	161	161	76	63	138	119	0	0	221	242
3.....	1,882	1,871	422	422	51	51	813	813	161	161	76	63	138	119	0	0	221	242
4.....	1,882	1,871	422	422	51	51	813	813	161	161	76	63	138	119	0	0	221	242
5.....	1,882	1,871	422	422	51	51	813	813	161	161	76	63	138	119	0	0	221	242
6.....	2,067	2,072	511	511	52	52	813	813	161	161	99	93	133	123	77	77	221	242
7.....	2,067	2,072	511	511	52	52	813	813	161	161	99	93	133	123	77	77	221	242
8.....	2,067	2,072	511	511	52	52	813	813	161	161	99	93	133	123	77	77	221	242
9.....	2,161	2,145	588	580	69	56	813	813	161	161	99	93	133	123	77	77	221	242
10.....	2,191	2,196	588	580	69	56	813	813	161	161	129	144	133	123	77	77	221	242
11.....	2,191	2,196	588	580	69	56	813	813	161	161	129	144	133	123	77	77	221	242
12.....	2,292	2,260	696	635	61	65	813	813	161	161	129	144	133	123	77	77	221	242
13.....	2,291	2,260	696	635	61	65	813	813	161	161	129	144	133	123	77	77	221	242
14.....	2,689	2,462	696	635	61	65	813	813	529	347	159	160	133	123	77	77	221	242
15.....	2,829	2,492	802	652	95	78	813	813	529	347	159	160	133	123	77	77	221	242
16.....	2,822	2,489	802	652	95	78	813	813	529	347	152	157	133	123	77	77	221	242
17.....	2,822	2,489	802	652	95	78	813	813	529	347	152	157	133	123	77	77	221	242
Total.....	39,407	38,080	10,099	9,442	984	905	14,634	14,634	4,370	3,642	1,990	1,986	2,423	2,190	924	924	3,978	4,356

¹See footnote at end of table 5.

TABLE 5.—BUDGET COMPONENTS OF THE COST OF RAISING FARM CHILDREN AS A PERCENT OF TOTAL COSTS AT 4 COST LEVELS¹

[In percent]

Budget component and sex	Thrifty	Low	Moderate	Liberal
Food at home:				
Boys.....	30	26	22	17
Girls.....	29	25	21	16
Food away from home:				
Boys.....	2	3	3	3
Girls.....	2	2	3	3
Housing:				
Boys.....	39	37	35	35
Girls.....	40	38	36	36
Transportation:				
Boys.....	12	11	10	10
Girls.....	10	10	9	8
Clothing:				
Boys.....	5	5	5	4
Girls.....	5	5	5	5
Medical care:				
Boys.....	7	6	5	5
Girls.....	7	6	5	5
Education:				
Boys.....	0	2	7	9
Girls.....	0	2	7	9
All other:				
Boys.....	5	10	13	17
Girls.....	7	12	14	18
Total:				
Boys.....	100	100	100	100
Girls.....	100	100	100	100

¹ Based on total cost estimates for boys and girls from table 1.TABLE 6.—COST OF RAISING A FARM BOY BORN IN 1960 AT THE MODERATE COST LEVEL IN PRICES CURRENT IN THE YEAR SPECIFIED¹

Year	Age of child (Years)	Total	Food at home	Food away from home	Housing	Transportation	Clothing	Medical care	Education	All other
1960.....	<1	\$1,196	\$174	0	\$547	\$113	\$66	\$61	0	\$235
1961.....	1	1,257	224	0	551	115	66	62	0	239
1962.....	2	1,273	226	0	556	117	60	71	0	243
1963.....	3	1,359	259	\$41	562	118	60	72	0	247
1964.....	4	1,376	261	42	569	119	60	74	0	251
1965.....	5	1,398	268	43	575	121	61	76	0	254
1966.....	6	1,736	343	40	589	123	90	80	\$213	258
1967.....	7	1,780	342	42	606	127	93	86	219	265
1968.....	8	1,856	353	44	632	131	99	91	229	277
1969.....	9	2,036	428	69	672	136	106	98	238	289
1970.....	10	2,181	450	74	721	143	141	104	248	300
1971.....	11	2,273	461	78	754	150	145	111	261	313
1972.....	12	2,458	579	91	783	152	148	114	269	322
1973.....	13	2,627	673	99	818	157	153	119	275	333
1974.....	14	3,355	773	111	913	576	199	130	293	360
1975.....	15	3,786	925	161	1,011	630	207	145	316	391
1976.....	16	3,998	944	172	1,074	692	213	159	331	413
1977.....	17	4,251	1,000	185	1,149	741	221	174	345	436
1960-77, total.....		40,196	8,683	1,292	13,082	4,461	2,188	1,827	3,237	5,426

¹ Data from estimates in 1973 dollars (tables 1 and 2), adjusted by index numbers in table 3, and rounded to the nearest \$1.

CLOTHING BUDGETS FOR FARM CHILDREN, 1977

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Annual clothing budget costs for farm children under age 18 have been developed on the basis of data from the 1973 Farm Family Living Expenditure Survey (FFLES) (9, 10). The budgets include costs for several age-sex categories and for four levels—thrifty, low, moderate, and liberal.

The levels of the budgets reflect the usual clothing consumption practices of farm families. They do not reflect scientifically determined standards of adequacy, because such standards have not been developed for clothing. Because clothing practices are, for the most part, socially or psychologically determined, clothing budgets should provide for garments that are suitable for the usual lifestyle of the individual and his or her self-concept or intended image at a level of expenditure consistent with the family's income and interest in clothing in relation to other forms of consumption. The estimates reported here, which include annual budget costs for six clothing categories, are based on the actual clothing expenditures of farm families in 1973. These expenditures reflect the size and composition of wardrobes of farm children, the durability of fabrics and construction, and clothing replacement practices.

USES AND LIMITATION

Standard budgets for clothing are used to help families manage their expenditures and make long-range plans. To manage month-to-month expenditures, the family must decide on a budgeted amount that fits its needs. Comparing the family's usual expenditures and wardrobes with average practices of other families helps the family select an appropriate cost level. Standard budgets also indicate how clothing expenses change as children grow older or as the size and composition of the family changes. In addition, State and Federal agencies often use standard budgets to assess the income needs of families.

Ideally, clothing budgets should include both quantity and cost information to enable users to evaluate the budgets in comparison with their own needs and to plan purchases that fit the pattern of the selected budget. A complete, detailed specification of a clothing budget would include annual costs, the amount budgeted for each type of garment, and the number of garments to be maintained in inventory. The information needed to construct this kind of budget is most readily obtained from studies of actual expenditure patterns of large samples of households representative of a given population.

The budgets presented in this paper, however, cover only total costs by clothing category. Although data from the FFLES on quantities

of 95 individual garments purchased are available, estimates for numbers of individual garments could not be developed.

It also would have been desirable to develop, as in earlier studies (1, 4, 6), separate estimates for individuals living in different climatic regions. The FFLES sample design, however, did not permit this.

The budget costs cover purchased clothing only. The actual inventories, especially for children, probably included additional garments handed down from an older child, received as gifts, or obtained from some other source without cost. A 1965-66 survey of one urban area found that only about 70 percent of the total amounts of clothing acquired by low- to moderate-income families was purchased new. This ranged from as little as 33 percent for children under 2, to 81 percent for male heads of families (2).

THE ESTIMATES

Budget costs, updated to 1977 price levels, ranged from about \$40 to \$120 at the thrifty level, \$60 to \$160 at the low level, \$90 to \$280 at the moderate level, and \$150 to \$440 at the liberal level, depending on the age and sex of the child (table 1). These cost differences probably reflect differences in the price of garments purchased, as well as the number of garments in the wardrobe and frequency of replacement. At the moderate and liberal levels, budget costs for teenage girls were generally higher than for teenage boys. Generally, clothing budget costs increased with the age of the child. Older children may have purchased garments with greater fashion interest and perhaps replaced these more frequently as fashions changed. Also, older children are probably more likely to participate in work or recreational activities requiring special clothing and to need a larger and more diverse wardrobe because of their more active social life.

Separate estimates were computed for six categories of clothing: Wraps, outerwear, underwear and nightwear, hosiery, footwear, and hats and all other items. The wraps category includes light and heavy coats and jackets. Outerwear includes suits, sweaters, pants, shirts, dresses, skirts, and sportswear. Underwear and nightwear includes diapers, underpants, undershirts, bras, slips, sleepwear, and robes. Hosiery includes socks and stockings; footwear includes shoes and boots. The hats and all-other category includes hats, gloves, handbags, jewelry, and accessories. The budget estimates do not include costs for fabric and other items for home sewing or for clothing upkeep.

For infants, underwear and nightwear accounted for the greatest proportion of total clothing costs, followed by outerwear. This would be expected because of necessary expenditures for diapers, particularly disposable ones. In all other age-sex categories, however, outerwear costs accounted for the greatest proportion of the total annual costs, followed by footwear. For example, at the moderate cost level, underwear and nightwear for infants cost \$48, outerwear \$32 and footwear \$16 out of the total annual clothing budget of \$111. In contrast, underwear and nightwear for girls aged 6 through 9 cost \$10, outerwear \$70, and footwear \$34 out of the total annual clothing budget of \$145. Generally, the hats and all-other category was the lowest of the total for all age groups.

LEVELS OF THE BUDGETS

The cost levels of the estimates reflect levels of living for families whose food expenditures correspond to the USDA's four food plans (7). The work of Engel examining the relationship between well-being and the proportion of total expenditures devoted to food underlies the use of the food plans as a benchmark for the levels of the budgets (5). The application assumes that families who spend at similar cost levels on food, allowing for differences in family size and composition, live at similar levels. These levels are, in turn, reflected in other areas of consumption. The food plans are based on actual food consumption habits, as well as on standards of nutritional adequacy, and indicate amounts and costs of 11 groups of food that together provide an adequate diet for individuals of a specified age and sex. An advantage of the use of food as a benchmark for indicating level of living is that food is the one category of consumption for which scientific standards of adequacy are available. The use of the food plans also allows consideration of differences in family size and composition, which is not possible with income, the more common indicator of level of living.

UPDATING PROCEDURES

Budget costs were estimated from the 1973 data (table 3) and then updated to 1977 (table 1) by subindexes of the Consumer Price Index (table 2). The apparel commodities index was used to update infants' clothing cost estimates; the women's and girls' garments index was used for the girls' garments categories; the men's and boys' garments index was used for the boys' garment categories; and the footwear index was used to update estimates of the infants', girls', and boys' footwear categories.

The estimates in table 1 account for price changes since 1973 when the data were collected, but do not reflect the extent to which families may have changed their allocation of total resources among all budget items or their allocation of clothing resources among all clothing items. For example, comparisons of clothing data from the 1972-73 Survey of Consumer Expenditures with previous Consumer Expenditure Survey (CES) data indicate that average family clothing expenditures, as a percent of total consumption expenditures, declined in both current and constant dollars. The aggregate, personal consumption expenditure (PCE) data, supplied by the Bureau of Economic Analysis annually as part of the U.S. national income and product accounts, also indicated a decline in clothing expenditures as a percent of total personal consumption expenditures for the same period. The PCE data indicated that this trend continued through 1977 (8).

The 1973 FFLES estimates are lower than previous budget estimates updated to comparable price levels (1, 6). Although this is consistent with trends as indicated by the CES and PCE data, changes in data collection, variable definition, and estimation procedures make direct comparisons of the present with earlier estimates invalid.

SAMPLE

The estimates were developed from survey data collected in 1973 and early 1974 by the Economics, Statistics, and Cooperatives Service (ESCS), formerly the Statistical Reporting Service of the USDA (9, 10). The Farm Family living Expenditure Survey (FFLES) was designed as a comprehensive study of the expenditures of farm operators' families. The self-weighting sample of 2,621 families provided data on family characteristics, expenditures, and income.

The clothing cost estimates were derived by use of data from 11 subsamples of the total sample. Each subsample included only those families with members of the age-sex category for which estimates were being computed. For example, data on the 242 families with infants under age 2 were used to develop clothing estimates for infants under 2. Thus, the size, age-sex composition, and expenditure patterns of families in the given category form the basis of the estimates.

ESTIMATION PROCEDURE

The methodology used to develop these estimates was modified from earlier USDA studies that were based on data from the 1960-61 Survey of Consumer Expenditures (1, 4, 6). Estimates of each clothing category were computed for each age-sex subsample, by use of multiple regression procedures. The functional relationships were:

$$\text{Equation 1: } F = f(P, S)$$

$$\text{Equation 2: } X = f(P, S)$$

The terms of the equations were defined as follows:

F = the value of food consumed by the family, adjusted to the food plan concept. This included food at home, food away from home, and home-produced food. The food plan concept assumes all meals are provided from food purchased for home consumption (7). However, most families in the sample ate some meals away from home or from home-produced foods. Such food generally does not substitute for the value of food purchased for home use on a dollar-for-dollar basis. The adjusted value of food consumed by the family, therefore, included only that portion of expenditures on food eaten away from home and the value of home-produced food that was estimated to substitute for food that otherwise would have been purchased for home consumption.

P = the value of family living expenditures representing the normal level of living. This included the sum of those items generally unaffected by short-term changes in income: Food, housing, transportation, education, clothing, personal care, gifts and contributions, personal insurance, upkeep, and miscellaneous expenditures. Automobile and home purchases, taxes, and major medical expenditures were not included.

S = family size.

X = per child expenditures, specific to age and sex, on the individual clothing category to be estimated.

The estimates were developed by use of a two-step procedure. In the first step, a value of P was derived at each of the average food plan

costs and the average family size specific to the age-sex subsample, based on the curvilinear relationship determined from equation 1. In the second step, an estimated value for each of the budget components was derived at the average family size and four levels of *P* from step 1, based on the linear relationship determined from equation 2.

AGE-SEX AND CLOTHING CATEGORIES

A major stage in the developing of the estimates was to obtain, from the FFLES data, clothing item expenditures for each child in the family, by age and sex. Ideally, estimates would have been developed for each year of age. However, because of sample size, estimates could only be made for ranges in age.

Data on clothing expenditures from the FFLES were collected for only five broad age-sex categories: Infants under 2, females 2 through 15, males 2 through 15, females 16 and over, and males 16 and over. These broad age ranges, however, mask considerable variation in clothing consumption. More narrow age-sex categories therefore were needed to reflect changes in consumption that accompany changes in physiological and social needs of individuals. Analyses of age-sex differences and trends of clothing consumption from the 1960-61 Survey of Consumer Expenditures (1), reviews of previous research, and examination of age-sex distributions in the FFLES data led to the development of 27 age-sex categories, 11 of which are part of these estimates for children. Age-sex categories for younger children reflect changes in consumption caused by periods of rapid growth as well as their usual activities at different ages. The increased concern for conforming to peer groups is reflected in categories for older children.

In order to compute clothing cost estimates for these new age-sex categories, observed expenditures on clothing for members of the original five age-sex categories had to be apportioned to individual family members in the new categories. In a few cases, where the family had only one child of a given sex in the 2 through 15 age range, all the reported expenditures for that category could, of course, be attributed to that child. In other cases, the expenditures had to be divided among two or more children. Observed expenditures on females aged 2 through 15 were apportioned to girls aged 2 through 5, 6 through 9, 10 through 13, and 14 through 15. Expenditures for girls 16 through 17 were apportioned from observed totals for females 16 and over. The same was necessary for boys. To divide the expenditures reported for the broad age-sex categories among family members, proportions were developed for each family which reflected its age-sex composition. The values used in these proportions were obtained from data on the entire sample by use of a multiple regression procedure that related observed expenditures in the broad age-sex categories to the number of family members in each of the new categories. The resulting allocation is, therefore, only an approximation of the actual division of expenditures among children for any one given family. The drop in budget costs between girls 14 through 15 and 16 through 17 probably results from this allocation procedure, because previous USDA budgets (1), which did not have to employ such a method, suggest that costs were equal or higher in the higher age range.

Data on the cost of 95 individual garments were collected in the survey. However, only a small number of families reported purchases of some items. In order to obtain reliable estimates, garments were grouped into categories. As nearly as possible, the categories that were developed were defined in such a way that garments that can serve a similar purpose in the wardrobe and are thus at least partially substitutable for one another were grouped together. All six clothing categories are applicable to all of the age-sex categories, and are consistent with the way garments are grouped in clothing subindexes of the Consumer Price Index. Total dollar expenditures for each clothing category thus formed the basis of the cost estimates.

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TABLE 1.—FARM CHILDREN'S CLOTHING BUDGETS AT 4 COST LEVELS BY AGE AND SEX: 1977 ANNUAL COSTS¹
[Dollars]

Cost level and age of child (years)	Total		Wraps		Outerwear		Underwear and nightwear		Hosiery		Footwear		Hats and all other	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Thrifty level:														
Infants.....	56	56	5	5	11	11	29	29	2	2	8	8	1	1
2-5.....	56	40	7	6	21	12	9	7	2	3	15	11	2	1
6-9.....	62	67	7	11	26	23	7	6	3	4	18	19	1	4
10-13.....	100	92	9	15	45	34	6	10	4	6	31	24	5	4
14-15.....	121	113	12	17	60	45	6	10	4	10	33	23	6	8
16-17.....	113	93	13	7	49	34	8	9	5	13	32	21	6	9
Low level:														
Infants.....	76	76	6	6	19	19	36	36	3	3	11	11	1	1
2-5.....	76	63	9	7	31	23	10	9	3	4	21	18	2	2
6-9.....	99	93	10	13	46	39	9	7	4	5	26	24	4	5
10-13.....	129	144	13	18	58	65	8	14	5	9	38	31	7	7
14-15.....	159	160	15	19	80	75	8	15	5	12	42	29	9	10
16-17.....	152	157	15	15	78	71	9	14	6	16	37	28	7	13
Moderate level:														
Infants.....	111	111	9	9	32	32	48	48	4	4	16	16	2	2
2-5.....	102	92	12	9	42	37	12	12	5	4	28	27	3	3
6-9.....	146	145	14	16	71	70	12	10	7	8	35	34	7	7
10-13.....	185	217	21	23	84	107	11	21	8	13	51	42	10	11
14-15.....	224	235	20	24	113	123	11	22	7	15	57	38	16	13
16-17.....	221	281	18	31	130	139	10	24	7	23	47	44	9	20
Liberal level:														
Infants.....	155	155	12	12	49	49	64	64	6	6	22	22	2	2
2-5.....	158	158	18	13	68	69	16	18	6	6	44	47	5	5
6-9.....	222	227	20	22	112	120	17	16	11	11	51	49	11	9
10-13.....	244	336	29	31	111	177	15	33	11	19	65	59	13	17
14-15.....	295	310	25	28	150	172	15	29	10	17	73	48	22	16
16-17.....	323	436	22	51	210	226	12	36	10	31	58	62	11	30

¹Budget costs were updated from estimates in table 3 using indexes shown in table 2, rounded to the nearest \$1, and totaled.

TABLE 2.—ANNUAL AVERAGE CONSUMER PRICE INDEX DATA FOR UPDATING AND BACKDATING ESTIMATES OF THE COST OF CLOTHING OF A FARM CHILD (1967=100)

Budget category	Infants' garments	Girls' garments	Boys' garments	Footwear
Consumer Price Index group	Apparel commodities	Women's and girls' garments	Men's and boys' garments	Footwear
1977 -----	151.6	146.4	154.0	156.9
1976 -----	145.8	141.9	147.2	149.9
1975 -----	141.2	138.1	142.2	144.2
1974 -----	136.1	134.9	136.4	138.1
1973 -----	127.1	127.3	126.4	130.2
1972 -----	122.7	123.0	121.9	124.9
1971 -----	120.1	120.1	120.3	121.5
1970 -----	116.5	116.0	117.1	117.7
1969 -----	111.9	111.7	112.4	111.8
1968 -----	105.6	105.9	105.7	105.3
1967 -----	100.0	100.0	100.0	100.0
1966 -----	96.0	95.6	96.5	95.3
1965 -----	93.6	93.8	94.0	90.0
1964 -----	92.8	93.1	92.8	88.4
1963 -----	92.0	92.5	91.6	88.0
1962 -----	91.2	91.8	90.4	87.1
1961 -----	90.8	91.9	89.9	85.9
1960 -----	90.3	91.6	88.9	85.1
1959 -----	89.0	91.2	87.2	82.2
1958 -----	88.2	90.8	87.3	79.0
1957 -----	88.2	90.9	87.8	77.8
1956 -----	87.3	90.4	86.4	75.4
1955 -----	85.8	89.8	85.0	71.6
1954 -----	86.3	90.6	86.0	70.8
1953 -----	86.7	91.4	86.4	70.0

Sources: U.S. Department of Labor, Bureau of Labor Statistics, 1975, Handbook of Labor Statistics 1975—Reference Edition, Bul. 1865; and Consumer Price Index Detailed Reports: December 1975, 1976, and 1977, February 1976, 1977, and 1978.

TABLE 3.—FARM CHILDREN'S CLOTHING BUDGETS AT 4 COST LEVELS BY AGE AND SEX: 1973 ANNUAL COSTS¹
[Dollars]

Age of child (years)	Wraps		Outerwear		Under- and nightwear		Hosiery		Footwear		Hats and all other	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Thrifty level:												
Infants.....	4,264	4,264	9,208	9,208	24,262	24,262	1,787	1,787	6,333	6,333	980	980
2-5.....	5,361	5,361	17,380	10,707	7,062	5,895	1,997	2,504	12,527	9,160	1,256	885
6-9.....	5,734	5,734	20,070	5,413	4,828	4,828	3,034	3,812	16,922	16,922	1,666	742
10-13.....	7,746	12,865	36,616	23,907	5,234	7,526	3,204	5,381	25,902	19,642	4,136	3,643
14-15.....	10,201	14,420	43,060	39,267	4,645	8,889	3,515	8,977	27,493	19,090	4,692	6,570
16-17.....	10,527	6,218	39,945	29,821	6,727	7,747	4,090	11,103	26,815	17,049	5,213	8,205
Low level:												
Infants.....	5,422	5,422	15,836	15,836	30,391	30,391	2,491	2,491	9,326	9,326	1,124	1,124
2-5.....	7,269	6,484	23,104	19,967	8,324	7,783	2,800	3,052	17,479	14,826	1,876	1,450
6-9.....	8,321	11,450	37,730	34,184	7,409	6,312	3,621	4,753	21,274	20,121	3,082	4,463
10-13.....	10,841	15,965	47,311	56,489	6,080	12,110	4,324	7,879	31,395	26,003	5,421	6,039
14-15.....	12,630	16,789	65,822	65,163	6,301	12,630	4,485	10,583	35,014	23,916	7,710	8,417
16-17.....	11,940	13,439	63,902	61,396	7,363	12,219	4,768	14,054	30,730	23,636	5,973	11,508
Moderate level:												
Infants.....	7,201	7,201	26,476	26,476	40,229	40,229	3,631	3,631	13,169	13,169	1,323	1,323
2-5.....	9,572	8,063	34,370	32,057	9,859	10,255	3,776	3,776	23,307	22,232	2,610	2,216
6-9.....	11,433	14,135	57,949	60,684	9,987	9,100	5,779	6,521	28,938	27,896	5,430	5,912
10-13.....	17,181	20,256	69,148	93,239	9,419	18,332	6,670	11,256	42,638	34,670	8,052	9,297
14-15.....	16,549	20,631	92,954	106,923	9,045	18,710	6,051	12,543	47,120	31,713	12,798	11,254
16-17.....	14,503	27,148	106,947	121,264	8,510	20,709	6,010	19,649	38,786	36,135	7,339	17,779
Liberal level:												
Infants.....	9,856	9,856	41,246	41,246	53,838	53,838	5,204	5,204	18,502	18,502	1,615	1,615
2-5.....	14,816	11,679	55,829	59,701	13,396	15,899	6,020	5,404	36,809	39,162	4,491	3,937
6-9.....	16,634	18,680	92,031	104,056	14,292	13,671	8,542	9,432	42,003	40,532	9,382	8,237
10-13.....	23,593	27,996	91,276	154,059	12,628	28,621	9,347	16,848	54,021	48,909	10,710	14,685
14-15.....	20,938	24,523	123,310	149,287	12,081	24,854	7,806	14,951	60,698	39,606	18,286	14,124
16-17.....	18,367	44,371	172,063	196,589	10,242	31,392	7,871	26,688	48,421	51,848	9,405	25,684

¹ Budgets were derived from expenditure data from the 1973 Farm Family Living Expenditure Survey, conducted by the Economics, Statistics, and Cooperatives Service, formerly the Statistical Reporting Service of the USDA. Estimates were based on data from families with members of the corresponding age-sex categories.

Note: Thrifty, low, moderate, and liberal budget levels were computed at levels of living which corresponded to family food expenditure at the USDA food plan levels. The budgets cover costs for garments and footwear, but exclude clothing materials and upkeep.

RURAL MOTHERS' NEEDS FOR CHILD CARE—ATTITUDES AND PREFERENCES: IMPLICATIONS FOR APPLICATION

(By Sarah M. Shoffner, Assistant Professor, Department of Child Development and Family Relations, Director, Home Economics Center for Research, School of Home Economics, University of North Carolina at Greensboro)

Substantial need for quality out-of-home child care exists in rural areas. A clear majority of mothers favor other-than-mother child care, while at the same time a majority evidence ambivalence in their attitudes toward motherhood as the primary role for women. Either child care in a day care center or in one's own home by a caregiver are identifiable preferred arrangements. These general statements (and forthcoming findings, implications, and recommendations) are based on responses from 525 mothers of children 0 to 12 years of age who live in 12 rural communities representing the distinct geographical areas of the Carolinas, selected according to a random sampling plan. Mothers' ages ranged from 14 to 60 years, with 86 percent under 40. Of these, 42 percent were age 29 and under. About a third of the mothers did not complete high school; another third were high school graduates; and the remaining third completed varying amounts of higher education. The number of children these mothers had ranged from 1 to 7 with an average of 2.26 each, with a mean of 1.76 under 12 years.

With the concept of need assessment as a first step in achieving care for all children, three overall questions guided the research: (1) What are the needs, existing provisions, and preferences for child care in rural areas? (2) What are mothers' attitudes toward other-than-mother child care? and (3) What occupational, educational, and cultural goals would rural mothers pursue if more and better child care were available?

NEEDS FOR CHILD CARE

How then does one establish the bases of needs for child care. The first answers come from a look at household composition, density of kinship networks, employment status, and future plans. In our random sample, although nearly three-fourths of the households were nuclear in composition (father, mother, and children), about 14 percent of the mothers were household heads. Someone other than the mother was household head in the remaining homes.

Kinship networks, or in this case, the number of close relatives living within proximity to the mothers, has implications relating to needs for child care as well as for the child care preferences the mothers indicated. Only one-fourth of the sample had no relatives living in the immediate residential area; whereas another fourth had all of their relatives living in the area. Others had one to five relatives nearby.

Rural women are not full-time homemakers—49 percent of the mothers were employed, and an additional 40 percent desired to seek employment if adequate child care were available. Over half of the working mothers were employed 40 hours per week, with 15 percent employed over 40 hours. The jobs represented were normally distributed among seven of the U.S. census classifications from professional and technical to laborers.

The women that were full-time homemakers did not see themselves remaining in that role—over half of them indicated definite plans to seek employment when their children were older, with nearly all of these planning to work before their youngest children were age 6, and 35 percent intending to begin by the time their children were age 1. Characteristically, younger mothers, mothers who are household heads, and mothers in larger households are those more likely to plan to seek employment in the future. Only 15 percent were not planning, at the time of the study, to seek employment. Of the mothers not employed, three-fourths had worked at some time since the birth of their children. A third of these mothers reported choosing to leave employment because of problems connected with their children.

Evidence was found that conceptualization of out-of-home child care is new for a large segment of the rural population. A large number of women did not know of or use the terms "child care" or "day care." However, the mothers could recognize their needs and relate to the lack of quality and quantity of available child care resources. Their knowledge of the availability of child care facilities in their communities did, in many respects, fit the profiles of the actual availability found in field visits.

Knowledge of terms, however, are of little importance when facilities are not accessible. For example, in North Carolina, the outlying rural communities were often too far away to utilize available services. Half of the sample segments were 4 or more miles from the nearest day care center, and two of the six sample communities had virtually no accessibility to a day care center. Also, geographical distribution of centers is noteworthy because rural residents of the Piedmont and mountain areas of North Carolina have greater access to day care centers than do residents of coastal and tidewater regions.

Family day care homes are more widely available to rural residents throughout North Carolina than are day care centers. Eighty-three percent of the sample residents were within 4 miles of a registered family day care home; while 50 percent were within 1 mile. It should be noted, however, that the number of registered homes is small in relation to the size of the population served. Homes generally do not advertise and are likely to be known to residents only by word-of-mouth. Thus, it is not surprising that many of the respondents knew of no family day care homes.

TYPES OF CHILD CARE USED

When considering availability and accessibility, it is understandable that very few of the mothers were utilizing out-of-home care as the plan most generally followed. The majority provided care entirely in their own home, with an additional 27 percent using a combination of in and away from home care. A relative giving care both in the child's home or in the relative's home was the most frequently used

plan. Neighbors, friends, babysitters, and day care centers were the next most often used.

A distinction was made between utilization of and preference for day care arrangements. More women in North Carolina used relatives to care for their children, but in proportion to use, more would have preferred a family day care home arrangement. However, in South Carolina, care by a relative in the child's own home was proportionately more often selected as the preferred arrangement, thus indicating a difference in preferences in the mothers from the two States.

In view of the evidenced need for more child care resources, it was surprising to find that a large majority of the mothers reported that they were well satisfied, overall, with their present child care arrangements. For employed mothers, child care problems regarding arrangements had not interfered with their work. Finding summer arrangements for school age children was not a problem for the majority, perhaps because of the nearness of relatives and close friends. These findings must not be viewed in isolation but in the context of other important findings about attitudes and preferences. As will be discussed in detail later, respondents had general difficulty expressing negative attitudes. Findings about satisfaction need to be seen in juxtaposition with stated desires for the optimum child care arrangement and with specific dislikes about present arrangements.

In order to examine dissatisfaction with existing provisions, mothers using other-than-mother care and those caring for their children in their own home cited conditions they disliked about present arrangements. Overall, the percentages for responses indicating dislikes were higher in the group caring for their children in their own home, than for mothers using out-of-home care. These areas of dislike common for both groups included: (a) not all children can have the same arrangement; (b) child is bored; (c) child is not happy with the present arrangement; (d) child is not getting enough supervision or attention; (e) child is not learning anything; and (f) child is not getting the training needed.

Mothers who care for their children at home want more time for themselves; they dislike that their children are bored; they feel out of touch with the outside world and want to spend more time with their husbands and friends. Wanting to spend more time in community activities and feeling tied down with children are also frequently cited main dislikes.

Mothers using other-than-mother care dislike: not having enough time to spend with their children; an undependable arrangement; not having the same arrangement for all children in the family; worrying about what might happen if child became ill during the day; inadequate meals; inconvenient hours; child not getting the training needed; and discipline not strict enough.

In assessing desired day care arrangements, should they become available in a community, three points can be examined: the type of care generally preferred, the specific features of day care desired, and mothers' degree of interest in particular types of care and services.

Child care in a day care center would be the preferred arrangement as often as care in one's own home. This statement, however, needs to be viewed in the perspective that responses were based on limited knowledge about and experience with a variety of types of child care

arrangements. Therefore, in using this information for program development or policymaking, more importance should be accorded to specific aspects of care desired rather than only to the stated general types of care desired.

Specific features of day care desired and mothers' interests in particular types of programs and services formed a group of distinctly preferred characteristics which can be summarized through the following description of a hypothetical "ideal type" of child care arrangement. This facility would be either a day care center or a family day care home in which parents would be involved in decisionmaking processes regarding program and operation of the facility. It would be located near the mothers' homes or places of work. Children ages 3 to 6 would be cared for from 8 a.m. to 4 p.m. and afterschool care would allow a child to be cared for at this facility for a few hours during typically nonworking hours. A trained staff would provide a developmentally focused program, including effective discipline, educational, and recreational components. This "ideal" situation would provide medical services and would make arrangements for the care of handicapped children. A comprehensive facility is this—designed collectively by rural mothers—a validation of the potentiality for partnership between child care professionals and rural mothers!

MOTHERS' ATTITUDES TOWARD CHILD CARE

Most mothers showed favorable attitudes toward other-than-mother child care. They believe that children should be cared for by someone other than the mother part of the time, and that such an arrangement is needed for developing independence in children. Mothers agreed almost unanimously that having a reliable place to leave children gives them peace of mind; and that fathers should help with child care if mothers work outside the home. (The aspects of fathers helping with child care when the mother is a full-time homemaker were not assessed.)

Although mothers favored other-than-mother child care as indicated by some of the attitude statements, they had difficulty in disagreeing with items that expressed unfavorable attitudes toward other-than-mother care. In direct contradiction to the aforementioned favorable attitudes, most of the sample thought caring for children is a "mother's place"; and 60 percent of the mothers thought that they "ought" to care for their children all the time during the formative years. Half of the mothers reported that their husbands wanted them to stay home to care for the children. Thus, an ambivalence in attitudes is suggested, even though mothers had no trouble specifying that they had need for child care, and in identifying the arrangements and characteristics they would desire. Further evidence of the extent of ambivalence was found when a distribution of the subjects showed that more than two-thirds of the mothers expressed several contradictory attitudes.

It seems, then, that traditional attitudes and values contradict reported current life needs and desires. Rural mothers appear to desire assistance in child care from others, but have difficulty in disagreeing with statements suggesting that mothers "should" care for their own children. Very few women in the sample appeared to be

able to assert a desire for assistance with child care, and at the same time also think that they had the "right" to desire it. Some of these notions could contribute to the fact that community support for adequate child care facilities is difficult to acquire, and that a national child care policy is as yet unattained.

POTENTIAL OCCUPATIONAL, EDUCATIONAL, AND CULTURAL GOALS DESIRED

If more and better child care facilities existed in rural areas and the amount of time mothers spent in child care were reduced, what does this mean for mothers' potential development and enrichment? Simply, mothers have a lot of things they want to do! Much interest was indicated in occupational, educational, and cultural categories of self- and family-development. This was evidenced by the fact that an average of almost five activities per respondent were cited as developmental interests, despite the ambivalence shown in mothers' attitudes toward other-than-mother child care.

Strongest interests were expressed in arts and crafts, continuing education programs, church school activities, getting together with friends or relatives for social activities, and gardening. Other frequently expressed interests were participation in the development of a child care center; volunteer services in organizations such as Red Cross, United Way, March of Dimes, et cetera; and participation in activities sponsored by the Extension Service.

IMPLICATIONS FOR APPLICATION IN RURAL AREAS

Although ambivalence in attitudes toward other-than-mother child care was found, families have needs and desires for more and better child care services. Mothers, and other caregivers, can specify what they need and the particular facets of optimum care desired. Also, they would like to use time freed from child care in developmental activities. Already the majority of rural women are employed, many on a fulltime basis; most of those not employed are seeking employment or plan to do so when the children are older. Many plan to begin or return to work before or by the time the last child is 1 year old. The full-time homemakers do not see themselves only in that role. They have expanded views of themselves as more than mothers—they plan to work and/or have other developmental interests.

Planning for child care services in rural communities begins with an assessment of individual needs of the potential users. Needs for types of day care in rural areas differ from the reported types used primarily in urban centers. A significant proportion of rural families with young children have a large number of close relatives living in the same area. This fact in itself affects the choice of day care arrangements. Educational emphases are needed because a number of parents are not aware of the varieties of options that can be designed to meet day care needs. Low operating costs as well as low fees for the consumer are also factors to be considered in the planning and development of facilities. This aspect of "low cost" itself may imply one avenue for attainment of child care services—help women mobilize themselves on the local level to plan ways to achieve or provide the desired care.

Feasibility for this was indicated with the findings that mothers want to be involved in the decisionmaking process.

The national trend in the reduction of Federal moneys to day care programs is reducing the potential for the maintenance or development of low cost, quality care. The reduced funding situation increases the need for innovative alternatives for providing low-cost, quality day care arrangements. The family day care home arrangement satisfies the low cost requirement and is potentially innovative. An example of an innovative day care-community systems model is "The Gathering Place"—formulated by June Rogers, Cornell University, Ithaca, N.Y., 1974. Since a large number of relatives are involved in child care, and since parent involvement in decisionmaking was a study component in which high interest was shown, it is suggestive that exploration of the development of neighborhood cooperative types of care would be useful.

The fact that availability of Federal moneys and professional resources from outside the community have been reduced necessitates more participation on the part of the community and consumers. The resulting situation suggests that awareness level, knowledge base, and clarity of needs must be identified by consumers to the point that they can make personal commitments to the process of developing innovative, functional, and stable child care facilities.

Although this study has established that substantial needs for increased quality and quantity of day care exists in rural areas, and that a great potential exists for family and personal development if such were available, developing new day care programs using community interest and resources is clearly a difficult task. Because of the low level of community awareness found in most communities, it is thought that many aspects of basic community development components would be required before local potential recipients of child care services could become involved in resource assessment. However, along with community contacts and descriptive information known, endeavors might be possible in initiating necessary community development and subsequently establishing needed child care services.

Also, there is another longstanding sociocultural barrier to overcome that impedes the commitment needed: The embedded notion that mothers "should" exclusively care for their children. Therefore, awareness education needs to precede program planning and ultimate community development. Components of awareness education should include "consciousness raising," assisting mothers to become conscious of their ambivalence about women's roles, subsequently to identify and clarify personal and family goals; education in child development, particularly in research data supporting the healthy growth of children in a variety of child-care situations; and education in the knowledge of components of a "good" environment for children's development. Increased self-knowledge and developmental orientation—personal and community—and increased competency in evaluation of child care situations on the part of potential consumers, would provide them with the needed stable bases for initiating and using new and innovative programs.

Achieving such a "prefacility development program," as described above, may need to be preceded by a preliminary process—that of finding those "active, ready-to-go, clear thinkers"—those parents

who are very much in favor of other-than-mother child care in quality arrangements—to serve as leaders. Accomplishment of such a task may very well pave the future because findings relating to women's role ambivalence may have, in a broader context, application for present and future child-care policymakers and present professionals working in the area of child-care programing. Role ambivalence may explain, on the other hand, the lack of public demand for a national child-care policy. Role ambivalence also adds another dimension to the difficulties encountered by program developers that researchers found in community assessment. Experiences reported by community agency personnel indicated that initial enthusiasm on the part of interested community leaders often failed to maintain sustained commitment to the effort. The reflection of cultural values that "it is a women's place to care for children" permeates all levels of the rural community, and affects not only the readiness of consumers to utilize services and their ability to participate in planning, but also affects the "established" community leaders who are themselves a part of this prevailing cultural milieu.

Taking into account the aforementioned cultural dimensions, dialog between existing community agencies, including motivated community lay leaders, could provide a support base for initiating planning in the area of child care delivery systems. Researchers' contacts with community agency personnel and residents, and the process of collecting community descriptive information, indicated that aspects of basic community development components would be required before recipients of child care services, even when awareness and commitment are present, could become productively involved in the development of day care facilities.

QUALITY CHILD CARE AND THE INFORMED PARENT

(By Canary Girardeau, Parent Guide Project Director, Center for Systems and Program Development, Inc., Washington, D.C.)

As I look around this audience, I see many people—men and women alike—who share a common concern. In order for them to be able to work, they must have day care for their children. For some of you, this experience is past now that your children are grown. For many others, you currently have—for better or worse—some type of child care arrangements. For still others, your family is in the planning stages, but no doubt you have already thought about the type of day care you will need. As a working mother, I, too, went through the process of finding day care for my four daughters when they were younger. And this concern is not unique to the people in this room. Parents everywhere, from all walks of life, with all sorts of needs, are concerned about finding and keeping a day care arrangement that is suitable for their children. Much of this concern is focused not merely on finding day care but on finding day care that is of high quality, that will provide a positive, learning experience for their children.

But what constitutes quality day care? How can a parent evaluate his or her child's day care arrangement? What steps can a parent take to improve the arrangement?

Some answers to these and other day care questions are being provided through a joint venture between my organization, the Center for Systems and Program Development (CSPD), and the Day Care Division of HEW's Administration for Children, Youth, and Families (ACYF). Today, I'd like to tell you a little about that venture.

In the fall of 1977, the Administration for Children Youth, and Families awarded the Center a contract to develop a Parent and Consumer Guide to Selecting Day Care Services. The Day Care Division, which has direct responsibility for the Parent Guide, has made as its overall goal "the improvement of the quality and availability of day care services nationwide." Our project was envisioned as one way of meeting that goal: Publication of a Parent Guide would help create a more aware day care constituency, who would be able to demand high-quality care.

CSPD's method of approaching this important goal involved both research and discussion. We have built a unique library of several hundred publications which include experiential, theoretical, and statistical studies in day care and related areas. We have also located day care experts from throughout the country. This group of experts includes advocates from national and local organizations, people from Federal, State, and local government agencies, researchers, directors of centers, day care providers, and, by no means least, parents themselves. These specialists have provided us with a wealth of child care information, both theoretical and "on the job."

We have held meetings, conferences, debates, brainstorming sessions, even party conversations with friends and strangers, to try to find out what parents want and need. From our research and discussion, we developed a detailed outline for a single 125-page volume.

This outline in turn was subjected to yet more discussions. As part of its contractual obligations, CSPD assembled a panel of these experts to review various stages of its work. The expert panel met in Washington, D.C., last March to look over the first outline. As a result of that meeting, we revised our initial outline to reflect some of the suggestions and comments.

The panel decided at that meeting, and ACYF later concurred, that a single, 125-page parent guide had the following drawbacks: First, it was so long that most parents would not take time to read it all; second, because the age range for children who need day care is so broad, the guide potentially contained material that would not be relevant to all parents; and third, the 125-page limit did not allow enough space to treat, in proper depth, the many day care issues of importance to parents.

Accordingly, ACYF asked the Center to develop the concept of a series of booklets—each complete in itself and addressing a specific issue relating to the selection of child care, yet together making up a definitive Parent and Consumer Guide to Selecting Day Care Services. We believe that this approach is more responsive to meeting the individual needs of parents and their children.

Our discussion process began anew. What, we asked ourselves and others, would be the most useful set of booklets for parents? Again, after much debate, we developed outlines for six booklets. Three of them are age-specific; that is, the booklets are directed to the parents of infants and toddlers, of preschoolers aged 3 to 5, and of school-age children aged 6 to 14. The concept of age specificity enables ACYF to provide a direct response to such questions as, "How do I go about choosing the best day care for my 4-year-old?"

The other three booklets provide, respectively, (1) an overview of the day care market, (2) possible solutions to some of the problems that may arise in any day care arrangement, and (3) a day care "directory" or resource booklet for parents who need child care.

These six outlines were circulated to our expert panel and to others in the field. The response was generally positive, and thus we began the actual research, writing, and design of the booklets themselves. The writers are individuals who have had many years of day care experience. They include day care parents, day care teachers, day care editors, and day care consultants.

The first drafts have been completed, and we're now in the "fine editing" stage of the project—a stage that will continue right up until the manuscript is submitted to ACYF for printing. We are waiting now to see if F-479 funds will be provided. We will continually be revising—and, we hope, improving—the booklets in response to ACYF and expert panel reviews, and to a possible field review slated for March 1979. The field review is to be held at six different sites and involved 50 to 100 parents. The expert panel will meet once more, and ACYF will be reading over our shoulder more or less constantly! Publication of the Parent Guide is scheduled for next summer.

Right now I'd like to take a few minutes to discuss in more detail the contents of the six booklets.

I'll be happy to answer any questions you may have when I'm through, and I'll also be pleased to meet with any of you later to get your comments and reactions.

Booklet No. 1, "An Introduction to Child Care," is designed to provide parents with an overview of child care, and to serve as an introduction to the other booklets making up the Guide. It contains a broad discussion of child development, with the developmental stages discussed in groupings that correspond to our age-specific booklets. The aim of this section is to give parents a look at the total development of their children so that they can understand what their children's needs are now and how those needs will be changing. Next, the booklet discusses the family's practical needs that will affect the choice of care: Cost, location, amount and length of care, and so forth. Finally, the booklet contains a detailed discussion of the three major types of care—in-home, family day care, and center-based care. It explains what they are, what they have to offer, and where a parent can find out more about them. Armed with the information provided in this booklet, parents will be ready to move on to the booklet specifically written for the age of their child.

Booklets 2, 3, and 4 are our age-specific booklets. For each age grouping we discuss: What the child needs as he or she develops; what the parent needs; what is available in the way of care; and what each type of care can offer children at different ages. Then, each of the booklets leads parents through a "finding and keeping" process for in-home care, for family day care, and for center-based care. For example, for in-home care, parents are given screening and interview techniques, lists of what to ask and what to tell, ways to improve the care arrangement as well as sensible—and sensitive—ways to end it. Throughout these and, indeed, all of the booklets, parents are supported, encouraged, and reassured. The booklets discuss guilt feelings about putting a child in care, ways to ensure that a child is making a good adjustment to day care, ways a parent can contribute to a successful care arrangement, and what the caregiver's problems and needs are, among other issues. For the family day care and center-based care sections, we also discuss such issues as licensing, professionalism versus babysitting, parent participation, health, safety, and nutrition requirements.

Booklet No. 5, "What To Do If * * *," provides information, in question and answer form, about problems and situations that parents might unexpectedly face. For example, what can a parent do if the day care center suddenly closes, or if the cost of the day care arrangement becomes prohibitive? It also contains anecdotes which show how real-life situations were handled or which emphasize the importance of a particular subject. The intent of this booklet is not only to provide practical solutions to very real problems but also to reassure parents that they are not alone and that they can cope.

Booklet No. 6 is a "Yellow Pages Directory" to child care. In its final form, it will be an alphabetical and cross-referenced compilation of resources grouped by subject. It will include the resources contained in the other booklets as well as additional resources.

The booklets will also contain questionnaires and checklists that parents can use to help them make decisions about the type of care

that is best suited for their children. The design of the booklets—the artwork, the colors, the overall format—will play a large part in getting parents involved in the Guide. You will find an outline of the Guide attached. You might want to look it over. If you have any comments or suggestions, CSPD would like to receive them. If you have any specific questions about this project, I'll be happy to answer them right now if I can. Thank you for listening.

A PARENT AND CONSUMER GUIDE TO SELECTING DAY CARE SERVICES:
AN OUTLINE

- I. Booklet 1. An Introduction to Child Care.
 - A. Child development.
 - B. Practical needs of families when choosing day care.
 - C. Three major types of day care:
 1. In-home day care.
 2. Family day care.
 3. Center-based day care.
- II. Booklets 2, 3, and 4. Selecting Day Care for Your Infant and Toddler, for Your Preschooler, and for Your School-Age Child.
 - A. Child development, age specific.
 - B. Practical needs of families when choosing day care.
 - C. A review of the three major types of day care.
 - D. Finding and keeping a suitable in-home care arrangement.
 - E. Finding and keeping a suitable family day care arrangement.
 - F. Finding and keeping a suitable center-based day care arrangement.
 - G. Evaluation and review checklists, questionnaires, and so forth.
- III. Booklet 5, What To Do If * * *
 - A. Day care situations and responses (about 15 topic areas, with about 10 situations per area).
 - B. Real life anecdotes about day care.
 - C. Evaluation and review checklists, questionnaires, and so forth.
- IV. Booklet 6, Day Care Directory of Resources.
 - A. Cross-referenced and alphabetical index.
 - B. Entries grouped by subject, covering all aspects of day care.
 - C. Evaluation and review checklists, questionnaires, and so forth.

THE COOPERATIVE EXTENSION FAMILY DAY CARE PILOT PROGRAM

(By Barbara A. Pine, Extension Associate, Department of Human Development
and Family Studies, College of Human Ecology, Cornell University)

The slide/tape program presented this afternoon describes a 5-year pilot demonstration project undertaken by Cooperative Extension at the New York State College of Human Ecology, Cornell University.

The Cooperative Extension family day care pilot program, begun in 1972 with special needs funding from ES-USDA, was an exploratory effort which resulted in the development of a community-based multifaceted educational program in support of people who provide child care in their homes for other people's children, family day care providers. It was extended thereafter from 1975-77 with funds from the Carnegie Corp. of New York.

In the United States the number of mothers working outside their homes increases each year. Working parents must seek substitute care for their children and they find a variety of arrangements. One of these child care arrangements is family day care, the oldest, non-parental, out-of-home child care in our society. It is the most widespread, most used and the child care least studied and least supported. What began as part of the extended family system among relatives has become an informal, often unstructured and isolated support to the nuclear and single parent family at all socioeconomic levels. Family day care is a viable alternative and chosen by many families because it is care in a family setting with the personal attention of a single caregiver. The family day care home is often located in the neighborhood offering convenience and familiarity for both parent and child. Hours during which care is provided can be flexible, accommodating parents who work evenings and weekends. Since family day care homes usually include children of a variety of ages from infancy to adolescence, siblings can be cared for together.

The Cooperative Extension family day care pilot program concentrated on the "institution" of family day care in which the roles of caring and providing a rich environment for the development of children are shared by parents and family day care providers. We know that very early experiences have an important effect on the growth and development of human beings. This means that, beginning in infancy, children are heavily influenced by the environment in which they grow up. Children need warm, loving care, a variety of experiences and an environment rich in learning opportunities.

The major goals of this program were to strengthen the existing system of family day care by identifying caregivers, to learn the needs of family day care providers as they perceive them, and to design,

with them, a continuing education program. Another goal was to build a support system for family day care and to link family day care to the existing human services network in the county. The program explored Cooperative Extension in the roles of friend, educator, and leader in strengthening family day care. Implicit goals were that the self-concept of caregivers would improve when people began to value their service and began to understand the importance of the roles family day care providers share with parents—providing warm, loving care and being the child's teacher. As feelings of self-worth and worth of the job to be done are realized, the quality of child care provided improves. This goal implied not only a concern with the child's development, including the relationship with his or her family. In support of this relationship, the final 2 years of the pilot project were focused on the parent who used family day care with the goals of strengthening the shared child care system, linking parents to the educational resources of Cooperative Extension.

When reference is made to quality child care in family day care homes it means a caregiving environment that ensures that the child's physical and psychological needs are met, that the child's sense of belonging to the family origin is not weakened by the family day care experience, that the child has opportunities to develop relationships of trust and attachment to a small number of familiar adults responsible for his or her care, that suitable opportunities are available for spontaneous, pleasurable learning experiences that foster growth of the child's developing competencies. The best family day care setting approximates a good natural home environment. The qualities most parents like to see nurtured in their child are the same whether the child is at home or in a family day care setting.

Another implied goal was the development of leadership skills among program participants so that they and the community leaders would gradually assume responsibility for the program over the 5-year period.

Operated out of a highly visible storefront resource center in Nassau County on Long Island, elements of the program include:

- A community-based resource center providing a meeting place on a daily basis for family day care providers, parents and staff of community service agencies;
- A regular informal educational program planned with family day care providers and parents using family day care—including meetings, workshops, and trips to community resources;
- Planned activities for children while caregivers attended program activities;
- Toys, books, and equipment available on a free-loan basis;
- A monthly family day care newsletter;
- A 16-hour certificate training course in cooperation with the local department of social services;
- A home visit program in which teenaged staff members were recruited and trained in child development for work with children in family day care homes;
- A referral and information service for parents seeking child care;
- The development and implementation of methods for outreaching to parents who used family day care for their involvement in educational activities; and

—Linking of family day care providers and parents to a broad range of community resources.

The pilot program reached over 400 family day care providers in Nassau County and there were between 200 and 300 visitors to the resource center each month.

The hypothesis upon which this pilot program in family day care was based is that when family day care providers and parents know you care, are easily accessible and are willing to work with them to develop an educational program, support and referral system which meets their needs, they begin to value quality child care and the role of child care provider. Both the care providers and the parent users learn about and more readily utilize services and resources available in the community.

The program's viability has been clearly demonstrated both as a replicable model and as an ongoing and integral part of the formal child care network in Nassau County. Following the fifth year of the pilot phase the program has been continued under the shared leadership of staff from Cooperative Extension, the Department of Social Services, the Day Care Council, and the Family Day Care Association of Nassau County which formed as a result of support generated by the pilot project. The unique features of the program have been described in a number of publications. National distribution of materials and information has resulted in replication of the model in whole or in part in many communities throughout New York and other States.

Cooperative Extension at the New York State College of Human Ecology, Cornell University, through the department of human development and family studies continues to identify family day care as a program priority. The director of the pilot project serves as a member of the department's extension faculty with responsibilities which include continued development of materials and the provision of technical assistance in family day care programing.

COOPERATIVE EXTENSION AT THE NEW YORK STATE COLLEGE OF HUMAN ECOLOGY—PUBLICATIONS IN FAMILY DAY CARE

"Family Day Care, A Cooperative Extension Pilot Program: Third Annual Report."

"Family Day Care: An Education and Support System Model."

"Learning With Love" (an 80 color slide set with synchronized cassette and script).

"Babies in Family Day Care" (a 93 color slide set with synchronized cassette and script).

"What To Look For in Family Day Care: A Guide For Parents."

INFLATION

INFLATION: CAUSES AND EFFECTS

(By Barbara B. Reagan, Professor of Economics, Southern Methodist University)

Public discussion of inflation is often almost hopelessly confused, and much is hysterically pitched. As economic leaders, I hope you will seek clarity in understanding, hope in approaching solutions, and sanity in the face of unwarranted worry. The real issues are bad enough without exaggeration.

I have been asked to summarize the causes of inflation and the effects of inflation.

I am going to stress the points on which many economists agree,¹ and not take time to explore controversies. You may want to stop me right here, because according to many journalists, everyone knows that there are as many views as there are economists. Clearly we economists know less than we wish we knew, but we agree on much. A recent survey of economists in academia, business, and government showed widespread agreement on microeconomic issues involving the price mechanism and less agreement on macro issues, especially normative prescriptions on what ought to be done currently. The survey found that the questions of greatest interest today for those outside the profession are also those on which there is less agreement among economists (J. R. Kearl, et al.). They are also questions on which much current work is being done.

DEFINITION OF INFLATION

Pure inflation would be a substantial, sustained rise in the general price level with all prices staying in the same relationship to each other. This, of course, does not occur in the real world.

More realistically, inflation is a substantial rate of sustained increase in the general price level. The general price level can be measured by the Consumer's Price Index (CPI) or better by the implicit price deflator for GNP, which allows for shifts in the mix of products produced.²

Some price increases are not inflationary, but along with price decreases are merely a normal part of the workings of a market system. For example, prices go up so as to allocate reduced supplies following a crop failure. Or if aggregate demand is increasing as the economy moves upward from underutilized resources, then prices would go up

¹ Because of the vastness of recent literature, this is necessarily a selective approach; the books and articles on which the summary is based are listed at the end. I am concentrating on domestic causes and effects of inflation.

² The choice of a particular price index may involve overstatement of inflation rates depending on whether prices measured include taxes, whether the price of government services is included, and how new products and technical improvement of quality are handled. Such problems are not discussed here.

in the sectors of increased demand for labor and goods. Neither of these cases constitute inflation. These price changes are self-limiting as the economy moves to a new equilibrium, and they signal changes in uses which are needed for economic efficiency. Thus, not all price increases equal inflation, only the sustained rise in the overall index used, which describes the terms on which a representative bundle of goods and services exchange for money.

Consider the 18 months, for example, from the beginning of 1973 to mid-1974, when the CPI rose by 16 percent. At the same time, its food component rose 25 percent. The dollar declined about 10 percent against other major currencies. This made imported goods more expensive for us, relative to our domestically produced goods. The price of oil and oil products rose sharply in response to the monopolistic restrictions of OPEC. Prices of natural resources other than food and fuel also rose. These above average changes in food, fuel, and raw material prices coupled with the relative rise in the price of imports made the inflation rate of about 16 percent feel worse to the large working and middle class in the urban industrial centers. At that time, wage rates had not increased as much as prices. Profits, on the other hand, had been rising, but the stock market behavior was dismal. Robert Solow notes that even if these relative price changes had taken place around a stable price level (that is with no inflation at all), the large group of nonfarmers, nonoil millionaires, nonforeigners would have still been very unhappy (Solow, p. 52).

Subsequently, medical service costs outstripped the general rate of inflation. These increases have involved market responses to increased demand for services, prevailing methods of payment for medical services, and continued shortage of medical practitioners. Furthermore, building materials are in short supply related to demand, and demand seems to be escalating.

As will be seen subsequently, sharp changes in relative prices that are greater than the general inflation rate can themselves contribute to further increases in the overall rate of inflation.

Our definition of inflation is not complete without noting that economists need to differentiate between the longrun and the shortrun equilibrium rate of inflation. A somewhat imprecise way of looking at the longrun equilibrium rate of inflation, but still a useful way, is to think of the longrun inflation rate as the average rate over a long time period.

A relevant distinction between longrun and shortrun inflation is to differentiate between inflation that is foreseen and taken into account in economic transactions and thus in the long run is perfectly anticipated, and in the short run, unexpected or imperfectly anticipated inflation. An important reason for the present strong public aversion to inflation is that inflation has been of the latter type; the inflation rate has not been steady and has not been fully anticipated.

CAUSES OF INFLATION

Long run

In the long run, inflation is caused by increases in the money supply. Consider a longrun view of an economy with some growth in output. The growth increases the demand for real money.³ The average rate

³ Money in dollars of constant purchasing power.

of inflation over a long period of time, is related to the growth in the nominal⁴ money supply that exceeds the growth in real money demand. The higher the growth rate of the nominal money supply, the higher the rate of inflation. On the other hand, the faster the growth rate of output and the more real money demand rises with the growth of output, the lower the inflation rate. In the longrun position, the rate of growth of output is equal to the potential rate of growth at full employment,⁵ and the rate of inflation is approximately equal to the difference between the rate of growth of output and the rate of growth of money stock.

A variety of economic and noneconomic factors can affect monetary growth allowed by governments. Too much money tends to be created when increased marginal benefits of government expenditures call for a spending increase that is best financed by taxation and inflation, as during a war, or when pressure groups negotiate increases in wages or other costs which will raise substantially the unemployment rate if not accommodated by more rapid creation of money. The accommodating monetary policy of governments around the world—namely, the supply of inflation—depends on potential loss of votes in future elections (Gordon, p. 198).

The present time preference of politicians for intermediate or near-term effects instead of longrun solutions leads us into the shortrun causes of inflation.

Short run

In the short run, other factors causing inflation have to be added to changes in the money supply—fiscal policy, expectations of inflation, supply shocks, and the levels of output, income, and unemployment in the previous time period. Of course, last year's factors cannot be changed by policymakers today.

It is the persistent effects of the lagged output, income, and unemployment plus the slow changes in the expected rate of inflation which make it difficult to reduce inflation without affecting unemployment adversely.

In the short run, the rate of inflation and the level of output depend among other factors on aggregate demand and supply.

Demand side.—On the demand side, increases in inflation rates are caused by increases in growth rate of money, increases in the full-employment budget deficit, and increases in previous output, income, and employment. If policymakers want to reduce inflation by affecting the first two of these variables by tight monetary and fiscal policies, such policies will tend to reduce output and the level of income as well. It should be noted that the resulting shortrun change in inflation is less than the change in the growth of the money supply.⁶ Thus, the correspondence between the money supply and the rate of inflation is weaker in the short run than in the long run.

Changes in the Federal budget are a major factor on the demand side. Such changes are affected, of course, by Government expenditures and tax policy. Escalation of the current inflation occurred in 1968 when the Federal deficit jumped from the previous year's \$8

⁴ In current dollars.

⁵ Full employment output is the output produced when unemployment is at the natural rate.

⁶ Aggregate demand rises because money in real purchasing power terms (i.e., real balance) has increased; it has increased because nominal money stocks have increased more rapidly than the price level.

billion to \$25 billion at a time when unemployment was below 4 percent. This deficit was incurred over the protests of economists, when we tried to finance the Vietnam war without raising taxes.

Recent fiscal policy has been affected by the need to compensate for large income leakages in the U.S. economy through foreign trade and buildup of State-local government surpluses.

Tax cuts without changes in Government expenditures are generally thought to be inflation producing. In the recent tax debate, it has been noted that a modest tax cut of the appropriate type can fight inflation by easing pressures for wage increases and encouraging investment, thus lowering costs and increasing supply. Tax relief, for example, might be used to encourage more private research and development spending, and thus relieve some of the Federal spending for research. Inflation is intensified by a slowdown in productivity, such as the drag that accompanies the heavy capital investment now required to meet environmental, health, and safety goals. Tax relief in such cases might have more effect on the supply side than on the demand side.

Inflation can be caused by an excess of aggregate demand that is larger than our economic capacity to produce, but our current problem is the far more intractable one when inflation occurs with underutilized resources.

Supply side.—On the supply side, the actual rate of inflation depends on the expected rate of inflation, the state of the labor market, and supply shocks, an important phenomenon in the 1970's.

The role of expectations of future inflation on the supply side needs to be emphasized. Nominal wages adjust downward slowly as unemployment increases, but they rise with expectations of inflation. Both workers and firms think in terms of real wages. Firms are willing to pay the higher wages that workers feel they need to stay up with inflation because firms expect to be able to pass the increases on to consumers in the price inflation they expect. The higher the rate of inflation expected, the higher the actual rate of inflation tends to be.

The state of the labor market, which includes inflationary expectations,⁷ also affects the current inflation rate because increase in unemployment and decrease in level of output occur together.⁸

A level of output below what could be produced at full employment (GNP gap) can involve an actual inflation rate lower than the expected rate of inflation. How much lower depends on the sensitivity of money wages to unemployment and how much unemployment reacts to changes in output. It is the slope of the aggregate supply curve that expresses how much decrease in inflation follows from a decrease in output and employment in the short run, or conversely, how much more inflation comes from an increase in output and decrease in unemployment.

Supply shocks (such as the largely external increase in materials' prices in 1973-74 due to the oil embargo, or increases in wage disturbances, excise taxes, and payroll taxes) shift the aggregate supply

⁷ The relation between inflation, expected inflation, and the difference between the unemployment rate and the natural rate of unemployment is incorporated into the expectations-augmented Phillips curve. Decreases in unemployment are accompanied by increases in labor force participation, and changes in overtime and productivity of labor.

⁸ The well-known Okun law is that the short run, for every 1 percent decrease in unemployment above the natural rate of unemployment (which was taken in the 1960's to be 4 percent), there is a 3-percent GNP gap (output is below what could be produced at full employment).

curve in the short run. A sudden increase in Government regulations ordering desired action rather than using economic incentives to obtain it is also a supply shock. The result is decreased production and more inflation.

In the 1970's, one of the factors causing substantial increases in unemployment in response to the largely ineffective attempts to reduce inflation through restrictive monetary policy has been the slowness with which inflation expectations were reduced. The expectation of inflation caused wages and prices to rise, and unemployment did not dampen wage agreements enough to restore full employment (Dornbusch and Fischer, pp. 408-410).

Equilibrium solution.—The shortrun rate of inflation and level of output are determined by the interaction of aggregate demand and supply curves. If the expected rate of inflation increases, the aggregate supply curve shifts upward, producing higher inflation and reduced output. Increases in money supply, changes in the full-employment budget surplus, and increases in the previous year's level of output shift the aggregate demand curve upward, thus increasing both inflation and output in the short run.

The shortrun equilibrium is linked with the long run in a dynamic adjustment process. The details of the adjustment process depend on the way expectations are formed. Expectations of future inflation can be based simply on recent experience, or they can be based on the anticipated growth in the money stock. Consider, for example, the adjustment path to a new longrun equilibrium after a disturbance in the rate of monetary growth⁹ under the simple assumption that expectations of future inflation are based on the rate experienced the past year. The path can be visualized as a curling movement so that the rate of inflation is sometimes higher and sometimes lower than the longrun equilibrium rate it is approaching. There are times that output decreases when the inflation rate increases; namely, stagflation.

If expectations of inflation are based on the growth of the money supply, then adjustment to growth in money would move in one period to the longrun equilibrium. In such cases the expectations turn out to be correct (rational expectations), growth in money supply was translated into inflation, and neither the growth rate of the output nor the unemployment rate is affected. If, however, wage and price adjustments are recognized as sluggish, then the adjustment process differs, and output is affected even with rational expectations.

Implication of model.—The model sketched here suggests that modern advanced societies operating at near full employment have entrenched expectations of inflation and thus an inflationary bias. In contrast to the good old days when wars heated up economies but recessions actually reduced prices, now economies begin to inflate before there are signs of excess pressure. The revision of prices downward requires longer and deeper recessions than seem bearable. In prior periods, the ordinary citizen had a deeper fear of recession and unemployment than today. Now we have numerous built-in, counter-cyclical programs to ameliorate the downside of the cycle. We have a national policy of full employment. Politicians, of course, fear reces-

⁹ Other changes such as fiscal policy are not covered here.

sion. No democratic government could survive if it permitted a major recession of the kind that used to occur. The typical citizen does not feel that a prolonged depression is likely. If it is expected that any recession will be brief, there is less tendency of business to reduce prices when markets soften because it is thought the markets will improve soon. When mass unemployment is unlikely, workers keep up the pressure for higher wages with more confidence. Furthermore, there is less temptation for business to resist the high wage pressure (organized or unorganized) if prices are being maintained or even raised, and if production will soon need to be increased (Solow, pp. 57-61).

As a result, prices are sticky on the downside.¹⁰ We have earlier noted that relative prices must change to reflect changes in supply, demand, or technology. If prices seldom fall, then normal market forces will set up a tendency for the price level to float upward. Such an inflationary episode might well be self-limiting, but another change in supply, technology, or demand would set off another upward drift.

A closely related reason for the resistance of prices on the downside is the pricing practices of oligopolistic industries. Economic concentration, particularly oligopolies, helps create inflation. Profit goals are set and tend to be maintained even as wage and energy costs increase. Special interest groups that want protection from the competition of the marketplace also contribute to sticky prices, and thus to inflation. The central core of industry is not very competitive, and response is not sensitive to changes in aggregate demand. Sometimes business even says it has to increase prices when aggregate demand decreases because overhead per unit is up.

Another related cause of inflation is the strong tendency for the pattern of wage differentials by skill level, by occupation, by industry to be maintained. Whenever one segment of the labor force gets ahead and disrupts the usual pattern, other workers try to restore the traditional differentials. This obviously occurs only at higher and higher wage levels, and subsequently higher price levels.

These explanations merge into the mainspring of inflation, that is the price-wage spiral by which each private group attempts to protect its own interests by passing on higher costs.

EFFECTS OF INFLATION

Unanticipated inflation increases uncertainty and makes planning by business, families, and government difficult. It may inhibit long-run risk taking. Inflation redistributes income so that some people win and some lose, but there is less agreement on how much.

Understanding of who is getting hurt is important before considering remedies. We must also understand how much of the hurt is a real cost of inflation. Economic leaders such as you must recognize the smokescreen of inflation complaints behind which the real goal is to flagellate favorite whipping boys, be they the opposite political party, the envied rich, the hated unions, the feared monopoly or oligopoly, greedy processors, the ever-threatening and burgeoning bureaucracy, or _____ (you fill in the name of your favorite demon).

¹⁰ Product diversity and costs of getting information contribute to sluggish product prices; job and worker diversity, costs of getting information, and long-term contracts contribute to sluggish wage adjustments.

This is too important an issue to us all to permit diversionary games.

Before selecting remedies, the marginal benefits to be gained from reducing the impacts of inflation must be weighed against the cost of successive increments of the inflation-curing medicine. Only if the marginal benefit from another spoonful of the medicine outweighs the bad taste and adverse side effects, should the additional medicine be prescribed. For example, in my opinion, the cure sometimes proposed of "biting the bullet" and inflicting recession, low production, and high unemployment long enough to change people's expectations and to make prices and wages more flexible downward is too costly. Similarly, the cost in economic efficiency lost, if rigid price controls were to be established, is too great at this time.

There may well be effective ways to decrease the losses due to uncertainty about inflation,¹¹ and make a moderate upward drift of the overall price level at a constant rate easier to live with. As a basis for such thinking, we must be clear as to what the effects of inflation are and which societal groups are most impacted. To do this, we must differentiate between the long run and the short run, between the effects of perfectly anticipated inflation and unexpected or imperfectly anticipated inflation.

Perfectly anticipated inflation.—If an economy has been having a given rate of inflation, say 6 percent, for a long time and if it is correctly expected that the rate of inflation will continue to be 6 percent, inflation has few real costs. The primary cost of the perfectly anticipated inflation is the cost of holding currency,¹² and even this is minor. In an economy with rational expectations, nominal interest rates will have been adjusted upward by the expected rate of inflation. Interest will be paid on demand deposits. Long-term wage contracts and leases will have taken the rate of inflation into account. Tax laws will have been indexed.

If in such an economy, people attribute their gains in wages and salaries to their own endeavors instead of seeing wage increases as merely partial cost-of-living increase, they feel they are getting ahead because of merit. Then when prices go up, they feel they have been injured because their real income didn't increase. Illusion such as this undoubtedly contributes to the general aversion to inflation and to a crisis of spirit.

Imperfectly anticipated inflation.—In reality, only small adjustments have been made in this country for inflation. (Two of the more important are adjustment of social security payments and Federal retirement benefits to changes in the price level.) The rate of inflation has not been correctly anticipated. Sharp changes in prices due to supply shocks exacerbate the uncertainty from inadequately anticipated inflation. They make long-range planning extremely difficult and require major adjustments to new cost situations. When inflation is imperfectly anticipated, the distributional effects of inflation must be considered.

The major effect of inflation is that savings and investments are undermined. Substantial inflation largely wipes out or severely weakens family financial planning and saving for retirement undertaken for many years by families in middle age or nearing retirement.

¹¹ Bonds that pay a stipulated *real* rate of interest, or indexing of the personal income tax so that inflation does not raise the effective rate have been suggested.

¹² The cost of holding currency is the income foregone by not holding an interest-bearing asset.

However, the low-income retired who live only on social security are not adversely affected when social security payments are indexed.

A major effect of inflation is to change the real value of assets fixed in money terms—money per se, bonds, savings accounts, insurance, and many pension plans. This shifts wealth from creditors (savers) to debtors. However, many people are both creditors and debtors. While they lose as creditors, they gain as debtors. If they own housing and are paying on mortgages, or if they have bought consumer durables—cars, household appliances, furniture—on credit, their real indebtedness is reduced by inflation as they pay with dollars of reduced purchasing power, and they have gained from inflation. To generalize, if a family has monetary assets exceeding debts, it loses. This is more apt to be true of established families on into retirement. If a family has more monetary liabilities than monetary assets, it gains. This is more apt to be true of younger families. The savings held in monetary form lose value only when inflation is not fully anticipated.

In general, wages tend to be bid up during an inflation. Real average hourly earnings adjusted for overtime in private nonagricultural industries were 5 percent higher in 1977 than in 1970 (Council, p. 298). In the postwar period evidence does not suggest that prices have gone up faster than wages allowing profits to expand. On the average, real wages are not greatly affected by inflation, although some workers may gain, and others lose.

Households in the economy are the major sector in a net creditor position and thus are the most vulnerable to inflation. The Government is the major monetary debtor with nonfinancial corporations the second largest monetary debtor group, and thus these could be major gainers. What actually occurs depends on whether any or all of the inflation was anticipated. Some of this may translate losses of families today to gains for future generations.

Inflation also pushes people into higher nominal Federal income tax brackets, and without indexing of tax rates, their real disposable income is reduced. This is the same result as if a tax rate increase had been voted.

Interest rates reflect partial adaptation to anticipated inflation. Lenders will seek higher nominal rates so as to receive real payments in the future as if prices had been stable. Although interest recipients at first look like gainers from inflation, the balance sheet effects, particularly taxes, result in a loss when inflation is greater than savers expected when they bought bonds or put money in the bank. Stockholders are also losers. There is evidence that unanticipated inflation has reduced the real return on common stocks, both in dividends and capital gains on equity.

As already noted, social security benefits and Government retirement benefits are indexed and thus follow prices with a lag. Supplemental security income (aid to blind, disabled, and aged) and food stamps are also indexed. State welfare payments vary as to how closely they are revised upward as prices inflate.

Property income such as rental income has lagged behind price increases. Private pension plan benefits nearly always are fixed in money terms and are not increased to adapt to inflation.

The redistributive effects of unanticipated inflation appear to be large. A composite analysis is needed to get at the cross effects of

various components. One recent suggestive analysis from Brookings does this using a simulated inflation and using two income measures (Minarik). The shift in income measures alters the findings sharply for the upper income families. The income measures used are first, the current cash income of the household as defined by the Census Bureau, and second, a more comprehensive concept of income including income in kind, taxes, and balance sheet changes such as appreciation in value of home and depreciation in the cash value of bonds.

The inflation rate considered varies in several ways. For example, the effects of inflation are simulated when the 1970 data base is adjusted from an inflation rate of 5.9 percent to a 7.9 percent rate of inflation (i.e., a 1-year increment in the rate of inflation of 2 points). Another time, the inflation rate after the 2 point increment is assumed to have been sustained for 5 successive years.

The results for average low-income and middle-income families vary little with the income measure used or the types of inflation assumed. (Of course, around an average, some gain and some lose even though the average does not change.) The Minarik study finds that—

Families with incomes under \$10,000 have their real income reduced less than 1 percent or on the sustained basis, less than 2 percent. The reduction is primarily caused by lags in adjusting transfer payments.

Middle-income families (\$10,000–\$25,000) are affected little or not at all by inflation. Most of their income is from wages and salaries, which tend to increase as prices inflate. Homeowners paying their fixed mortgage payments benefit from inflation, but this is offset by upward adjustment of income taxes.

The upper income groups (above \$25,000) gain or lose from inflation according to the income measurement concept used and type of inflation assumed, as follows:

A. Cash income (Census definition):

1. The first year that the inflation rate increases by 2 points, interest rate income increases and upper income families gain by about 1 percent of real income.

2. By the sixth year of the sustained inflation at the higher level, the lag in dividends overcomes the gain in interest, and there is a net loss of real cash income up to about 2 percent.

B. Accrued comprehensive income:

When the more comprehensive concept of income which includes balance sheet effects is considered, the results are dramatically different, and upper income families suffer sizable losses. Income tax increases, lagging corporate retained earnings, and depreciation of the face value of interest-bearing securities are the major sources of loss.

The above findings are for the average effects of inflation for various income groups. When the income groups are subdivided into households whose heads are over age 65 and all others, the adverse effects of inflation on the elderly are shown. A 1-year inflation increment of 2 points lowers the comprehensive real income of the elderly up to about 10 percent at income levels under \$100,000. This is because most of their income is from property. At high incomes above \$100,000, elderly and nonelderly alike suffer from 10 to 18 percent loss up to \$400,000 incomes. Age there makes no difference because most income is from property regardless of age (Minarik, p. 9).

In summary, low-income families as a group fare fairly well in inflation on the average except the elderly who have only private pensions or the elderly who have retirement income other than social security. Besides the elderly, those most hurt by inflation are the upper income recipients.

A social pessimist would end a summary of the effects of inflation by warning that unanticipated inflation results in intense conflict among economic groups. This can lead to a crisis in economic management, loss of faith in government, and catastrophic social disintegration. Some authoritarian form of government would result, not necessarily able to control inflation, but able to suppress objectors.

As a social optimist, I take a contrary path. I have faith in the flexibility of our institutions and our ability to invent new institutions if need be to agree upon national priorities, to follow a price-income policy, to stop intense inflation, and to accommodate to gentle inflation.

PARAMETERS FOR SOLUTIONS

This summary sets the stage for considering solutions and discussing issues. In my view, the general parameters of the solutions must be as follows:

1. The marginal benefit of the solutions must outweigh the marginal cost.
2. Solutions must impact steadily without stop-go shocks.
3. Enough time must be allowed so that the results of the policy can be seen. As economic leaders, you must counsel patience.
4. We must seek ways to achieve consensus planning. We must accept a pattern of action and then all work hard to make it succeed. I again call your attention to the role of expectations.
5. The solutions must be diverse and must be targeted to increase price stability or to ameliorate the adverse effects of inflation we can't avoid.

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INFLATION: A VIEW FROM THE FEDERAL RESERVE

(By J. Charles Partee, Governor, Federal Reserve Board)

Comments on the inflationary problem, based on 30 years experience as a business and financial economist. Conclusions—

I. Most people still underestimate how difficult it is to control inflation. It cannot be done by cutting the Federal budget, or by getting the other fellow to behave, or—practically speaking—by single-handedly curbing the growth of the money supply.

Problem is that prices and incomes go hand in hand, except to the extent that the productivity of the economy grows. Cite statistics for two cycles.

II. Macroeconomic policy has a role to play in encouraging a balanced economy and in avoiding periods of excessive demand, but it cannot do much about cost-push inflation without exacting a great deal of economic pain. Curtailment in money and credit would make it impossible to take output off market at current prices, and in most sectors of the economy, output would fall. But the policy would have to be held long enough to change attitudes toward pricing, wages, and inflation to do any great lasting good.

III. Inflation, certainly at anything like the current 7- to 8-percent rate, is bad for the economy (value of money halved every decade or less).

1. Inequity and hardship for some of our people, no matter how comprehensive the protections and indexing schemes.

2. Disadvantages savings, so that consumption is encouraged and there is insufficient financing for investment needed to keep economy growing.

3. Rate of inflation tends to accelerate, since people come to anticipate it and, in process, augment it.

4. Inflation is likely to lead to economic instability, because planning and spending will be distorted and irregular. Inflation thus breeds recession.

IV. What to do? Recognize inflation as the major permanent economic problem of our society, and adapt all thinking about public and private economic behavior accordingly.

1. For governments, impose a discipline of tight fiscal controls and require economic impact evaluations for all new programs and initiatives.

2. In the area of regulation, recognize explicitly the cost impact of programs and policies. Adding to business costs through imposed standards of performance adds to inflation just as certainly as does increased Federal expenditures not offset by tax revenue.

3. Encourage research and investment expenditures in all feasible ways in order to enhance productivity performance. Opt for policies that increase supplies (rather than restrict demand) wherever possible.

4. For private sector behavior, recognize the public disservice involved whenever excessive wage and price increases occur. Employ the white heat of adverse publicity.

5. For monetary policy, run a deliberately conservative course, taking advantage of any opportunity provided from the demand side to moderate growth in money and credit.

My intent is not to counsel the inevitability of recession which would be counterproductive. But it is essential that public attitudes be shifted away from the expectation of inflation and need for compensating gains in nominal income. No one wins in this kind of environment; instead, I am convinced that—sooner or later—we all stand to lose.

CYCLICAL COMPARISONS

[Percent change over period (19 quarters)]

	1960: II- 1965: I	1973: IV- 1978: III
CPI-U (all urban) excluding food, energy.....	6.34	42.30
Gross domestic product deflator (fixed weighted—1972 dollars).....	6.13	42.60
Compensation/hour (nonfarm business).....	19.38	52.00
Productivity—output/hour (nonfarm business).....	15.94	5.83
Corporate profits with IVA and CCA (current dollars).....	57.57	63.95
Proprietors income with IVA and CCA (current dollars)—net of farm income.....	19.78	47.05
M1.....	15.20	33.12
WPI (all crude materials).....	-2.66	28.07
WPI (crude materials excluding food and fuel for manufacturing).....	.78	25.31
Import price index (fixed weighted).....	.39	64.13
Unit value index for imported materials.....	-7.09	165.86
Farm income.....	3.85	-14.87
Corporate profits/real GNP.....	28.82	46.18

The President in his address to the Nation on inflation October 24, 1978, stated that:

"The Government now extends economic privileges to many parts of the private economy—special franchises, protected wages and prices, subsidies, protection from foreign competition. If wages or prices rise too fast in some industry, we will take that as a sign that those privileges are no longer needed—and that this protection should be removed.

"We will make sure that no part of our economy is able to use its special privilege or its concentrated power to victimize the rest of us."

INFLATION AND AGRICULTURE

(By Bruce Gardner, Texas A. & M. University)

Inflation is seen by farm people as a threat, perhaps the greatest threat they currently face, to their economic well-being. This concern appears in practically every survey or other forum in which opinions on the subject have a chance to be expressed. I would like to explore today the nature of these concerns, and the impact of recent inflationary episodes which created them.

The nature of farmers' concerns about inflation is not so easy to specify as might be supposed. The reason is that the term "inflation" has in general usage come to refer to a wide variety of economic evils. Almost anything that reduces real incomes is called inflation by someone. In particular, it often seems to be the case that farmers, when they express concern about inflation, have in mind not the general price level per se but rather a failure of farm product prices to rise as fast as farm input prices. The basic problem perceived has to do with the relative prices of products and inputs, and could arise under deflation or recession as well as inflation. My subject today is the consequences of a macroeconomic inflationary environment on agriculture, i.e., a sustained increase in the general level of prices.

WHAT IS BAD ABOUT INFLATION?

Economists have focused great effort on spelling out the macroeconomic costs of inflation. The most serious of these costs seem to be associated with unanticipated fluctuations in the rate of inflation, which lead to instability throughout the economy, including the costs of international adjustment to a depreciating dollar. In addition, inflation constitutes a tax on holdings of money, which has social costs analogous to those of a tax on any resource or product. The main sectoral effects discussed by macroeconomists involve the gains of debtors relative to creditors when an unanticipated acceleration of inflation occurs. The debtors can repay their creditors with less valuable dollars than they borrowed, to an extent not captured in interest rates paid, and so debtors come out winners from unexpected inflation.

None of these macroeconomic effects of inflation seems to be the primary source of concern in agriculture. The issue of primary importance to farmers remains the relative price of products they sell compared to products they buy. Similarly, concerns of agribusiness beyond the farm gate involve prices for the farm and other goods and services purchased rising faster than the prices that consumers are willing to pay for given quantities of finished products. The question then becomes one of how relative prices behave under inflation, and whether any predictable relative price effects can be expected.

In part, the worries of both farmers and agribusiness interests involve the political economy of inflation. Food retailers see a threat of political control of food prices as a response to high inflation while farm prices are subject to less rigid control. Farmers see a threat of political control of farm product prices while their costs are left uncontrolled. In view of the events of 1973-74, when the Federal Government experimented with both retail price controls on food and export restraints in an attempt to dampen the rise of grain and oilseed prices, the worries of both groups are not unreasonable.

Yet it has never been established that recent inflationary spurts, or the policy responses to them, have generally tended to make farmers or agribusiness worse off in real terms. Let us now turn to an examination of the record of farm prices and incomes under inflation.

THE IMPACTS OF RECENT INFLATION

On prices of food and farm products.—The Consumer Price Index for all items in mid-1978 was 197 compared to a base of 100 in 1967, while the Consumer Price Index for food on the same base was 215. The index of prices received by farmers in mid-1978 was also about 215 (although for 1977 it averaged 183). These figures do not indicate great difficulty of either retail food or farm product prices keeping up with general inflation over the past decade. The index of prices paid for farm inputs has risen slightly more than prices received, to 220 in mid-1978, but the overall productivity of those inputs has increased more than enough to offset the relative price change.

Nonetheless, there could well have been a tendency for farm prices or retail food prices to lag behind accelerations in the general price level or input prices on a year-to-year or month-to-month basis. Tweeten and Griffen¹ in one of the few empirical investigations of the subject, find evidence that "national inflation exerts a real price effect on the farming industry, reducing the parity ratio" (p. 10). Their evidence is derived from annual data on prices received and paid by farmers for the years 1920 to 1969. This evidence is particularly striking in view of the common belief that the inflationary periods of World War II and the Korean war were good for farmers.

Recent developments in the tools for empirical analysis of time series permit more sensitive testing for the time relatedness of correlated price series than was undertaken by Tweeten and Griffen. Preliminary results from work I have been doing on monthly data from January 1967 to August 1978 suggest that retail food prices, farm

¹ Luther Tweeten and Steve Griffen, *General Inflation and the Farming Economy*, Research Report P-732, March 1976, Oklahoma Experiment Station.

product prices, and farm input prices respond quickly to changes in the general price level. However, the effect of general price level changes on farm prices received is much less regular and predictable than the effect on prices paid. This result is an instance of the well-known fact that farm product prices are much less predictable than farm input prices. But it is not clear that farm product prices habitually rise less fast or respond less quickly than input prices under inflation.

On farm incomes.—The behavior of farm prices is not necessarily revealing about the bottom line of farmers' interests, the net income earned from farming. The analysis of prices leaves out changes in productivity and costs which could negate any increases in the relative prices of farm products. To obtain direct evidence on this subject, it is necessary to look at data on net farm income in different inflationary environments. Table 1 shows the data on annual inflation rates and corresponding food price increases, real farm incomes, and real equity gains in the period 1948 to 1977.

In order to see more clearly the difference made by high rates of inflation, consider the following regression on real net farm income as a function of the rate of inflation and trend:

$$Y = 819 + .946\% \Delta CPI - .41T, R^2 = .58$$

(5.32) (6.66)

where Y is the USDA estimate of the aggregate net income of farm operators (including inventory adjustment) in 1967 dollars, and T is trend. The figures in parentheses are "t" statistics. The data are annual, 1948 to 1977. The results indicate that real farm income has been higher in years when the rate of inflation was higher. For each 1 percentage point increase in the rate of inflation, real income has been \$950 million (1967 dollars) higher. This regression is much too crude a basis for concluding that inflation has actually caused higher incomes. The causal factors could well be variables that are not included in the regression. Nonetheless, the results above and related regression results not reported here are evidence against the proposition that inflation has generally tended to harm agriculture.

Net farm income is an incomplete measure of the economic situation of farming as a business, because it leaves out of account changes in the value of farm business assets. In an inflationary environment, owners of fixed assets will incur real losses unless the value of their assets rises at least as fast as the rate of inflation. Regression showing the relationship between the growth of the real equity of owners of farm assets (farm operators and nonfarm owners of farm assets) and the rate of inflation yielded the result that more inflationary years tended to show slightly higher real rates of increase in farm equity. However, the effect is not statistically significant.

TABLE 1.—THE RATE OF INFLATION AND REAL INCOME AND WEALTH VARIABLES

Year:	Rate of price rise ¹		Real farm income ²	Real equity gains ³	Real food profits ⁴
	CPI	Food			
1948	2.4	-0.8	24.13		295.7
1949	-1.8	-3.7	17.64		315.8
1950	5.8	9.6	18.58	19.64	317.1
1951	5.9	7.4	20.17	2.69	250.7
1952	.9	-1.1	18.49	-8.05	254.8
1953	.6	-1.3	15.98	-3.49	278.7
1954	-5.5	-1.6	15.03	-.64	302.7
1955	.4	-.9	13.84	4.22	339.0
1956	2.9	3.1	13.26	6.63	381.4
1957	3.0	2.8	12.09	2.30	400.7
1958	1.8	2.2	14.08	10.07	431.4
1959	1.5	-.8	11.56	9.08	461.1
1960	1.5	3.1	12.28	-2.54	477.7
1961	.7	-.9	11.83	3.98	497.0
1962	1.2	1.5	11.58	3.72	512.4
1963	1.6	1.9	11.23	2.36	534.1
1964	1.2	1.4	9.25	3.19	575.4
1965	1.9	3.4	11.42	9.78	618.5
1966	3.4	3.9	11.41	4.20	652.3
1967	3.0	1.2	9.60	-1.21	634.0
1968	4.7	4.3	8.92	6.93	623.7
1969	6.1	7.2	10.01	-1.59	615.5
1970	5.5	2.2	9.30	-5.88	656.7
1971	3.4	4.3	9.66	4.81	636.0
1972	3.4	4.7	11.94	16.53	600.9
1973	8.8	20.1	22.45	28.84	673.3
1974	12.2	12.2	16.53	-10.71	551.5
1975	7.0	6.5	14.31	14.78	738.0
1976	4.8	.6	10.35	20.42	805.3
1977	6.8	8.0	10.20	6.29	818.9

¹ Changes in price indexes from December to December. Source: "Economic Report of the President," 1978.

² Net income including inventory adjustments deflated by the CPI, billions of 1967 dollars. Source: USDA, "Farm Income Statistics."

³ Changes in farm asset owners' equity, January 1 to January 1, each level deflated by the month's CPI (1967 = 100), billions of 1967 dollars. Source: Bruce Hottel, Texas A. & M. University.

⁴ Sum of reported earnings of 18 food processing and retailing firms, deflated by the CPI, millions of 1967 dollars (American Bakeries, Amstar, A. & P., Beatrice, Borden, CPC, Campbell, General Foods, General Mills, Heinz, Kellogg, Kraft, Kroger, Quaker Oats, Safeway, Standard Brands, Stokely Van Camp, Winn Dixie).

Agribusiness profits.—The position of the large food processing and retailing companies might be thought more favorable than that of farmers for coping with inflation. While farmers are pricetakers, being for all practical purposes unable to influence prices by market management, for large agribusiness firms price is a variable that can be manipulated in the search for profits. Nonetheless, even the giants face constraints from budget-conscious consumers and the competition of rival giants, and pygmies trying to grow. Moreover, one would expect whatever market power these corporations can exercise would be used year-in and year-out, inflation or not. There is not an obvious a priori reason why this market power would be increased when the rate of inflation accelerates.

The data necessary to judge how agribusiness actual has fared under inflation are difficult to come by. There exists no series of statistics for food industry profits that would be comparable to USDA's farm income statistics. In order to get an indicator to work with, I took the reported pretax net earnings of 18 large food processors and retailers which were available for the entire 1948 to 1977 period. Their aggregate earnings, 1967 dollars, are shown in table 1. Regression analyses like those reported above for real farm income indicate that in fact these corporations have been worse off in inflationary periods in real terms. The effect, although statistically significant, is

small, with a reduction of a little over 1 percent in real earnings being associated with each 1 percentage point increase in the rate of inflation.

WHY WORRY?

Indications are that farmers, though perhaps not agribusiness firms, have done fairly well in the recent inflationary environment. Of course, there have been both good and bad years; the point here is that the rate of inflation does not appear to be a strong influence on which are which. If anything, the farm sector seems to have done relatively better in years when inflation has accelerated.

This situation is nothing new, of course. In the late 19th century farm spokesmen saw deflation as the chief economic evil facing farmers. Believe it or not, between 1865 and 1895, cost-of-living indexes declined on the order of one-third, while the prices of farm products fell by over one-half.¹ The point of William Jennings Bryan's "cross of gold" was that cheaper money would help farmers.

Both a priori reasoning and empirical work indicate that a rise in farm input prices, such as induced by energy price increases, tends to make producers of farm products worse off. When input prices rise, so long as demand is not perfectly inelastic or supply perfectly elastic (neither of which is the case), producer surplus decreases. The results from the postwar data above suggest that periods of general inflation have not tended to coincide with periods of increase in the relative costs of producing farm products. The results do not imply that real cost increases are harmless to farm producers. And there is good reason for farmers to be concerned about the outlook for inflation in farm costs as a result of real (as opposed to monetary) factors in nature, the international energy or resource markets, or domestic governmental activity.

Today's discussion, and the data cited, leave out entirely a final reason why those involved in agriculture have good reason for concern at the present time. This is the unprecedented degree of risk, and the new and unfamiliar sources of risk, that exist in today's inflationary environment. What is the nature of the risk? It is the risk that inflation will be checked, coupled with our lack of knowledge about the macroeconomic consequences of bringing inflation under control.

The United States seems to be experiencing a longer term acceleration of inflation, a seemingly chronic situation that we are not accustomed to. This chronic inflation is manmade, by men in this very city of Washington. It is not a matter of the Arabs or poor crops or workers' greed. I conclude this because other countries, notably West Germany and Japan, were as much or more affected than the United States by the initial shocks which began our current inflationary episode. Yet these countries have by now brought their rates of inflation down to roughly half the U.S. rate. I realize that I'm getting on thin ice here, not being an expert on the causes of inflation. But it does seem clear that inflation is a problem that something can be done about over the next few years, while it is not at all clear that something will be done about it. This creates an environment of extreme uncertainty for the highly leveraged holder of real assets. To illustrate, consider the following situation:

¹ The statistical basis for these calculations is of course much less secure than for the recent data. The figures cited use series from U.S. Department of Commerce, "Historical Statistics of the United States."

Mr. A wants to purchase 200 acres of farmland for \$1,500 an acre. Having equity of \$100,000 in land, he can borrow two-thirds of the \$300,000 needed for the purchase, paying a 9-percent interest rate. So Mr. A after the purchase has assets of \$400,000 with \$200,000 debt to go with his \$200,000 total equity. Mr. A's income statement for this land will look something like this: the \$400,000 in land yields an income flow at the long-term rate of about 3 percent (\$12,000 per year). The \$200,000 in debt costs about \$18,000 in interest payments.

Mr. A can expect, if inflation continues at the rate of 6 percent and land prices move with it, to capture \$24,000 per year in nominal wealth gains. Thus there is a return of $\$24,000 + \$12,000 - \$18,000 = \$18,000$. This constitutes a total return, including unrealized capital gains of 9 percent on Mr. A's \$200,000 equity. A normal market rate.

The first problem that becomes apparent in this example is a cash flow problem. Since the \$24,000 is unrealized, the net realized return is $-\$6,000$. Mr. A must either increase his borrowing on the basis of the nominal wealth gain or else increase his equity by use of labor income or other income sources. Compare an identical investment by Mr. A in the absence of inflation. The interest rate would be 3 percent, there would be no wealth gain, and the return would be $\$12,000 - \$6,000 = \$6,000$, a 3-percent rate of return on \$200,000 of equity. Again, the net rate of return equals the interest rate, but the cash flow problem does not arise. Thus, inflation creates real difficulties for the expansion or acquisition of farm enterprises by those who rely on debt finance, mainly young farmers.

Besides the cash flow problem, another consequence of inflation is that Mr. A is operating in a very risky environment. Over and above the usual commodity price and production risks, a change in the general rate of inflation can affect these results greatly. If inflation should accelerate, the land price gains will be greater, and the 9-percent loan will turn out to be a great bargain. But suppose that our Government does indeed bite the bullet and brings inflation down. Then the increases in land prices, as other prices, will tend to decelerate. The interest costs will not. The resulting net losses can easily be large.

Long-term interest rates will not adjust downward until the markets are convinced that the long-term rate of inflation has declined. When interest rates on mortgages finally fall, the losses could sometimes be cut short by refinancing debt at the lower interest rates. Nonetheless, there is a real risk of substantial, even crippling losses to leveraged landowners when the rate of inflation is reduced. This is not surprising. Instability in the inflation rate is not a free lunch; if leveraged landholders make extraordinary gains when inflation accelerates, we should expect a corresponding opportunity for losses.

The overall result is an extraordinary element of risk imposed by an inflationary environment. Farmers, like the rest of us, simply have no way of forecasting whether inflation will accelerate or decelerate in the years immediately ahead. But the economic uncertainty they face in this environment is much greater than for most of us. This is perhaps the cost of inflation that impinges most seriously on the farm sector as compared to other sectors.

SUMMARY STATEMENT OF THE PROBLEM

Inflation creates problems for our economy as a whole, and the farm sector shares in the resulting burdens. In addition to those mentioned above, there are the tax effects of being pushed into higher income tax brackets without a corresponding increase in real income. And investors in depreciable assets, both farm and nonfarm, find themselves unable ever to depreciate for tax purposes the real value of these assets, since by the time a \$25,000 machine is depreciated it costs \$50,000 to replace it.

It is more difficult to isolate harmful effects of inflation which are particular to agriculture. Indeed, in recent inflationary periods the farm sector appears to have come out rather well in several respects. The real prices and incomes of farm people do not appear to have been adversely effected, though I certainly would not wish to claim that the evidence presented here will be the last word on the subject. However, there is reason to believe that farm operators today, particularly highly leveraged owners of farmland, are put in an extremely risky financial situation, much more so than most of us, by the great uncertainty that exists concerning future trends and fluctuations in the rate of inflation.

ANTI-INFLATION PROGRAM

(By Rudy Oswald, Director, AFL-CIO Department of Research ¹)

Labor is deeply concerned with inflation—the recent AFL-CIO Executive Council has stated that they agree with President Carter's conclusion that inflation is the Nation's No. 1 problem; support his determination that prompt, remedial action must be taken; and concur in his contention that austerity must be shared equally by all Americans.

They pointed out that the American worker and particularly those living on fixed-income retirement benefits are the chief victims of inflation.

They further pointed out that during the last few years, the sad but incontrovertible fact is the real income of working people has been reduced, and each additional week brings additional distress to America's working families and retirees.

And they concluded, saying:

So it is with reluctance that we find the program devised by the President's economic advisers to be inequitable and unfair.

The President's program proposes budgetary cuts which could increase unemployment. It threatens continuation of regulatory actions designed to protect workers, the environment and the economy.

It does not protect consumers from runaway price increases for the four necessities of life—food, energy, housing, and medical care—the areas where inflation hits hardest.

The program excludes, for all practical purposes, all sources of income except wages.

The price guidelines is so flexible as to be nonexistent, and is without effective enforcement. It allows those who raised prices the most in the past 2 years to profit further from that conduct.

The wage controls are inflexible, and not voluntary, and will be eagerly enforced by every public and private employer in the land, and by the IRS, and by the threats of black-listing and official denunciation.

The wage control figure for Federal workers, set at 1½ percent below the control figure for all other workers, is clearly discriminatory.

There is no provision whatsoever for control of profits or interest rates, now rapidly approaching all-time highs and endangering the entire economy and particularly the housing industry.

Dividends, capital gains, unearned income from tax shelters—all are completely free to climb without limit. Commodity speculators remain free to drive up the prices of food and other raw materials.

¹ This is a presentation by Rudy Oswald, director, AFL-CIO Department of Research, largely based on the statement of the AFL-CIO Executive Council on the anti-inflation program.

Banks and other financial institutions remain free to speculate at will against the American dollar. Professional fees are not effectively controlled, and there is no mechanism for halting rapid increases in rents.

There is no mechanism for adjustment of inequities caused by wage controls. The low-wage exemption of the Nixon Pay Board, mandated by Congress, was far more equitable. That figure, exempting the working poor, was \$3.50 an hour. Using the same formula today, the low-wage exemption would be \$5.50 an hour, not the \$4 the President has decreed.

The decision to include all fringe benefit costs in the wage control figure is simply impractical. Government-mandated costs for pensions, for example, will reduce the wage portion of the package far below the figure needed to catch up with living cost increases alone.

The so-called "Real Wage Insurance" is vague, details are non-existent, and the legislative route is so unpredictable that we cannot honestly tell our members that they would have the protection the President promised.

The AFL-CIO Executive Council went on to point out that they do not determine the collective bargaining goals of the affiliated unions. In the final analysis, the members of the 60,000 public and private sector collective bargaining units that will negotiate contracts over the next year must determine for themselves what they need to provide food, housing, energy and medical care for their families. In making their decision they will consider the costs of all the necessities they must provide for their families, and the profitability of their employer.

When they read of the adverse reaction to the President's program as reflected in the continued devaluation of the dollar and observe the continued rapid rise in the costs of food, housing and medical care, and the additional profits for energy companies that will follow adoption of the natural gas deregulation bill, they certainly will not feel confident that others are equal partners in austerity.

While the program demonstrates the President's desire to address the problem of inflation, the plan his advisers have devised is unfair and inequitable, and the end result of their ill-considered proposals could well be another recession, with mass unemployment, which one administration spokesman after another is already predicting.

Since another recession, with mass unemployment and widespread suffering, is unthinkable and since the President's economic advisers have so far rebuffed suggestions for changes to make this third anti-inflation program more equitable, the Executive Council concluded the time has come for mandatory, legislated, economic controls.

They stated: We do not like controls. We do not welcome Government operation of the marketplace. But recession is worse; runaway inflation is worse; the discriminatory application of wage controls is worse; the distorting of laws for purposes other than those intended is worse; public scapegoating without due process is worse.

Therefore we urge the President to draft a legislative program of full economic controls, covering every source of income—profits, dividends, rents, interest rates, executive compensation, professional fees, as well as wages and prices.

It is our belief that this matter is of such urgency that the President should call a special session of the Congress for the development of a

full and fair controls program. Such a program should be detailed—not a standby grant of unspecific authority to the President. It must be a program that treats all Americans equally, provides a prompt and proper mechanism for the adjustment of inequities, controls prices for everything and lasts only for the duration of the emergency. Such a full, legislated economic control program has now become the only responsible method for halting this inflation.

Since we believe the administration is already headed in the direction of overall controls in piecemeal and ill-designed stages, America might as well do it right and do it now. That means legislative action must be prompt, the mechanism fair and effective, and the sacrifice equal.

If those criteria are met in a legislated controls program, such a program would have labor support.

Controls are not a long-term solution. Rather, they are a short-term shock treatment to jar the economy out of its expectations for inflation. It is necessary to change the public attitude away from the expectation that inflation will continue.

The current program basically provides for action against wage increases rather than prices and does not address other sources of income. Any control program needs to be evenhanded, and cover all prices as well as all sources of income.

A control program needs to be massive, such as existed during World War II. During that period of extreme emergency, with 12 million members in the Armed Forces, and with defense production demands, 63,000 price enforcers still were assigned to the Office of Price Stability to address the question of inflation. A large staff today would be able to be responsive to particular industry issues or area questions, and would provide visible exemplification of the desire to alleviate inflation. That needs to be done now, and be done rapidly so that the economy can throw off the yoke of continued inflation expectation.

INFLATION AND THE CONSUMER: CONCERNS AND ISSUES

(By Esther Peterson, Special Assistant to the President for Consumer Affairs)

I appreciate the opportunity to be with you today at the Agricultural Outlook Conference for 1979. In choosing "Inflation: How, Why, and Impacts on the Producer, Consumer, and Labor" as your program theme, you have certainly selected a topic that heads the list of concerns for the Carter administration and for the citizens it serves.

Midway through 1978, the Opinion Research Corp. found that almost 9 out of 10 people said they were being hurt by inflation. This is hardly earth-shattering news. At least 9 out of 10 people who stop me on the street, or speak to me in the supermarket or at meetings, would heartily agree. Inflation is a very personal threat to our citizens. I don't want to downplay the ability of the average consumer to comprehend sophisticated economic policies, but I can tell you from my own experience that most consumers are baffled, upset, and feeling helpless about inflation. Monetary and fiscal policies don't hit home. Consumers learn the value of a dollar at the checkout stand, not in foreign money markets. Consumers see the cost of their groceries going up and up, and they don't know what to do. Food prices, unlike appliances or automobiles, confront consumers every week—thus food price inflation is No. 1 on the consumer "Hit Parade."

You have already heard experts on the hows and whys of inflation this morning. My role today is to talk about Inflation and the Consumer: Issues and Concerns. The issues and concerns are quite obvious to each individual consumer.

How do they feed themselves and their families nutritious meals while inflation is eroding their resources? How can people adjust their eating patterns to maintain nutrition value while spending less money? How do we as a government assure food safety and quality without creating a crippling economic burden on producers, which they will ultimately pass on to consumers? How do we best use our decreasing government dollars to promote a better quality of life for all our citizens? And how do we bring the needs of producers, processors, retailers, and consumers together into a coherent, equitable, national food policy?

Tough questions, tough times. But at the risk of being trite, I would like to emphasize that we are a tough nation with the ability, abundance, and dedication to use our resources and technologies to find solutions.

I don't want to bore you with many more statistics. I would, however, like to share my perspective of the consumer's plight with you, before I attempt to answer the questions I have posed.

Inflation is hurting consumers more today because it is concentrated primarily in the essentials. The rate of inflation was about the same in all commodities in 1974, but it has been in recent times considerably greater in the essentials. Inflation in the essentials this year is double that of other commodities. And food inflation, as you know, plays a unique role in our perceptions. Meat price increases, led by a 25 percent increase in beef prices, have an even more profound effect on consumer perceptions. Meat is the largest single component of the food budget. It's no wonder the consumers surveyed said they were feeling the pinch.

Since July consumers have experienced some relief in the rate of food price increase, though from December 1977 to December 1978, the food price increase will approach 12 percent.

What is the source of food price inflation? The search, let me emphasize, is not for a culprit, but for the causes. Efforts to moderate inflation can begin only with the knowledge of what needs attention. There are several identifiable sources of food inflation. The farm value of food has risen more than 23 percent over the past 12 months, thus farm prices are a cause. The farm/retail margin which includes processing, transporting, and retailing is up 15 percent.

The Federal Government shares part of the blame—or deserves part of the credit, depending on your perspective—for the rapid increase in farm prices this year. The Food and Agriculture Act of 1977 was designed in large part to boost farm prices to profitable levels. However, most people, including the experts at USDA expected the process to be more gradual. And, nobody expected cattle prices to reach \$60 per hundredweight in the spring of 1978. Continued herd liquidation was supposed to delay the high meat prices at least through most of 1978, but it didn't happen. Recovering grain prices hit at the same time and meat prices skyrocketed.

This inflation also breeds more inflation. Higher cattle prices even caused sugar prices to rise, adding another \$150 million to consumer food prices. This odd connection stems from the section of the 1977 farm bill which supports sugar prices. Whenever the cost of farm production rises—feeder cattle represent about 11 percent of production costs—the price of sugar rises.

Nowhere does inflation breed inflation more effectively than in the Federal budget. A slight rise in food prices of as little as one-tenth of 1 percent has striking secondary effects. Since one-fifth of the budget is indexed so that expenditures like social security automatically rise as prices rise, a one-tenth percent rise in food prices will automatically boost Federal expenditures and the Federal deficit by \$17.7 million. And that, too, adds to inflation. Food price inflation this year alone will add \$2.5 billion to the Federal deficit.

Inflation—especially in the prices of food and other essentials—also feeds on itself through its impact on wages. When workers must dig up 12 percent more for food bills they are justifiably reluctant to accept modest pay increases. When wage packages contain cost of living escalators, then labor costs will rise. Prices inevitably rise as a result. Thus, what may have begun because of weather, or the cattle cycle, or Government action, ends up being a permanent part of the inflation problem.

We have all read about the anti-inflation program the President announced October 24. One aspect of the program is wage and price guidelines coupled with various incentives for compliance.

Another aspect of the program is a reduction in Federal spending. Reducing Federal spending is a curious phenomenon. Everyone agrees with the need to cut the fat out of the Federal budget, but no one agrees on what is fat. Farmers are the direct recipients of billions of dollars in deficiency payments. Low-income consumers look to the Government for relief from hunger—the most despicable of human conditions. As President Carter said earlier this week:

“Look at the government as an entity and recognize that each interest group, however deserving, must be considered in the overall framework of how much better it will be served if inflation is controlled.”

There is also a sectors program where the President will seek more directly to moderate prices. Some industries have tariff or quota protection from import competition. If prices begin rising rapidly in those industries, the President can lower those trade barriers. In the food sector, for instance, there are restrictions on the importation of food commodities, including meat and sugar. Should prices begin to rise for those commodities, import restrictions could be either relaxed or removed altogether. Acreage limitations are in effect for both wheat and feed grains. If world conditions result in rapidly rising grain prices, those acreage limitations could be revised.

Prices for some food products are supported at specific minimums, usually a percentage of parity. Milk, for instance, is to be supported at at least 80 percent of parity, until September 30, 1979, when the marketing year ends, after which the minimum support price falls to 75 percent of parity. As a means of moderating price increases, one option will be to maintain the statutory minimum.

Efforts to control food price inflation will not be limited to the farm level. Retailers and middlemen are expected to adhere to the guidelines as they apply to marketing margins. The Department of Agriculture and the Council on Wage and Price Stability have begun a joint effort to ensure that farm price decreases are quickly and accurately reflected in retail prices. Also, when farm price increases occur, they are to see to it that retail prices rise no more than is justified.

The Government will thus be closely monitoring all segments of the food system. But farmers, too, have a new challenge ahead of them that calls for some monitoring of their own. From my vantage point, it appears that our food system is moving away from the good wholesome basic farmer produced foods toward an overreliance on chemicals. Obviously, this movement will translate into an underreliance on the basics that are produced on our farms. Why should a mother ask her children to drink milk when her kids prefer chocolate flavored, nondairy substitute that she thinks is nutritionally equivalent. Why take the time to make a nutritious lunch when she thinks she is doing that by adding boiling water to a packet to get a bowlful of flavored noodles? I hope you will help in our quest to upgrade nutrition education about the cost, safety, and quality of basic farm foods as opposed to overly advertised, high profit items. We cannot get the word out all by ourselves.

Consumer education, then is one partial solution to the havoc of food price inflation. We need it in the school system, in libraries, in adult education classes, and in the media to somewhat balance the millions spent by the food companies each year. We also need it at the point of purchase, and I would like to applaud the recent efforts of three food chains—Wegman's Price Choppers, and Giant for their innovative approach to nutrition education that promotes good nutrition and its link to good health, throughout the grocery store. Hopefully, these pilot projects will spread and will help people to learn how to make nutritious meals for as little cost as possible.

As I mentioned earlier, many consumers need to learn how to readjust their purchasing patterns to get equal nutrition for less money. Many low-income people—contrary to what some nay-saying critics would have us believe—are quite adept at preparing nutritious meals on low budgets by relying on grains and legumes for proteins and carbohydrates. But as more and more of the consumer's dollar goes to pay for housing, energy, and health care, there is less available for food. People who never before had problems with meal planning are having them now. We must all help to teach our citizens that good nutrition does not have to cost more, and that in many cases it can cost less.

No discussion of inflation and the consumer would be complete without mentioning food quality and safety. My personal philosophy in this area is that the Government must act to protect the safety and quality of food, but it should do so in as responsible and rational way as possible. This administration adheres to this line of reasoning, and I believe does so in an exemplary fashion. Of course, USDA has no desire to close down any business. Instead, it is assuring that its efforts to keep adulterated substances out of the food system are always coupled with training and assistance programs to help industry comply. It's a good balance. Unsafe food, after all, is no bargain to anyone.

I also want to applaud USDA for major advances in conducting its business in the open and with the full participation of the public it serves. A breath of fresh air has swept through these halls since Bob Bergland became Secretary of Agriculture, and I couldn't be more pleased. I'm sure there are those of you who yearn for the good old days when policies and decisions were made behind closed doors, away from the "prying eyes" of the public. But, my friends, openness and citizen scrutiny and involvement are keystones of the democratic process, and they are measures upon which President Carter insists.

For example, it would no doubt have been easier for USDA, FDA, and the food industry to design a new food label that meets their criteria, but that would not have been the democratic way. Instead they held public hearings in five cities and talked to thousands of average consumers to determine what information they want and need of their food labels to help them get the best nutritional value for their shrinking dollars.

The result, I feel, will be a consistent food label that gives consumers the information they require and which gives industry the assurance that there will be one label they can count on to facilitate future planning.

The facts and observations I have presented will no doubt trouble some of you in the audience. They trouble me, too, and I raise them because I find no good answer to the inflation problem. The role of Government is to help, to intervene to correct the imbalances.

In the future, some tough choices will have to be made. I don't have all the answers. Inflation is not a traditional problem, nor does it respond to traditional remedies.

But, I do know that all of us—consumers, processors, farmers, and retailers—owe it to each other to find a better way to solve the inflation problem. We will learn a great deal in the days to come. We have to. Hopefully, what we learn will help us to translate the needs of each sector of the food chain into a coherent national food policy that guarantees the survival of our family farm system, provides a fair return on labor and investment to farmers, processors, retailers, and food industry workers, and a reasonable price to all consumers.



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